NEW ZEALAND JOURNAL OF

Agriculture

DECEMBER • 1949

Cooper News
Cooper's World-Famous Stock Remedies

FARM BULLETIN published by COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD.
World famous Manufacturers of Sheep Dips, Worm Drenches and other Stock Remedies.

No. 8. PUBLISHED EVERY SECOND MONTH DECEMBER, 1949.

NO SORE TEATS NOW!

Thanks to COOPER'S DAIRY OINTMENT

COOPER'S DAIRY OINTMENT

When we introduced COOPER'S DAIRY OINTMENT on to the N.Z. market we expected and provided for a big demand because its unique and outstanding qualities had already made it a popular remedy in England.

The demand, however, has been so great that for a while we could not meet it by some tons but we are catching up and your supplier has it or can get it for you.

COOPER'S DAIRY OINTMENT is entirely different from any other veterinary ointment. It combines new and exceptionally powerful antiseptic properties with a texture as smooth as vanishing cream. It is water-miscible and non-greasy which means that it can readily penetrate watery wounds and can be washed off with warm water without soap.

It is a powerful preventive against mastitis, does not taint milk and is invaluable as a general veterinary ointment for udder massage, chapped and cracked teats, skin wounds, cuts, abrasions, dermatitis, eczema, calving, lambing and general use on all farm livestock.

Make sure you try COOPER'S DAIRY OINTMENT next—a trial will prove the claims. Available in 2lb. tins.

FREE BULLETINS

We will gladly post any of the following Bulletins on request to us at Box 599, Auckland:—

"THE SHEEP KED"
"LICE"
"SHEEP BLOWFLY"
"INTERNAL PARASITES OF SHEEP"
"MODERN SHEEP DIPPING"
"COOPER SHEEP SHOWER"

TO OUR FARMER FRIENDS EVERYWHERE WE EXTEND
The Seasons Greetings

NO WORMS

IN SHEEP OR CATTLE

If the right drenches are used at the right time the drenching operation can be a most profitable investment repaying many times over the cost and labour involved.

WHAT DRENCHES TO USE—

For general treatment (Sheep or Cattle), PHENOVINE phenothiazine powder should be first choice. Available in 1lb. and 10lb. tins it is easy to mix and economical to use.

For Tapeworms:

COOPER'S N.C.A. DRENCH containing nicotine, copper-sulphate in most effective form. A 16oz. bottle makes sufficient drench for 160 sheep or 426 lambs or 80 to 320 cattle according to age.

For Liver Fluke in Sheep:

COOPER'S WORM DRENCH AND LIVER FLUKE REMEDY based on Carbon Tetrachloride. Palatable—sheep like it. Quarts, halves and gallons.

NO LICE EITHER!

After a Dusting with COOPER'S LOUSE POWDER

Domestic animals of every kind and breed are subject to attack by lice. Young stock, aged animals and those in poor condition are most liable to be affected but although really acute infestation is less likely on animals in good condition, there is no immunity except that conferred by a vigilant farmer.

COOPER'S LOUSE POWDER containing "Gammexane" gamma BHC should be on every farm. It kills and protects against lice on all livestock, also lice and mites on poultry and is very effective for treating refuse tips to reduce the fly population by killing larvae as they emerge.

COOPER'S LOUSE POWDER is available in handy 1lb. and 2lb. duster top cartons.

NO "MESSING ABOUT" WITH FLEXOPAD BRANDING

There is no longer any need for mess and wastage of material in the branding operation. With a FLEXOPAD it is only necessary to fill the reservoir with marking fluid and you can brand something like 400 sheep without handling the fluid again or wasting a drop. Your stencil brand is cut on a leather pad—a job that any saddler can do for you or you can do it yourself. Branding is clean and simple—a firm pressure on the animal (or any article to be marked) leaves a clear-cut lasting brand. Get a FLEXOPAD; it soon pays for itself in saving of time, labour and material. Price 44/9.

NO FLEAS AND MANGE ON DOGS!

PULVEX Flea Powder is used by dog owners the world over. It is non-poisonous, odourless and completely effective because it *kills* fleas, not merely stupefies them.

4oz. tins, 1/10 :: 1lb. tins, 4/10

KUR MANGE is an insecticidal dressing for the treatment of those skin eruptions (commonly called "mange") usually associated with the presence of fleas, lice and ticks on dogs. This remedy has often succeeded where many others have failed.

4oz. tins, 2/9 :: 8oz. tins, 4/6

If not procurable from Chemists or Stores, ask them to procure or write to us at Box 599, Auckland.

All the products featured on this page are obtainable from Stock and Station Agents and Merchants or write:
COOPER, McDOUGALL & ROBERTSON (N.Z.) LTD. - - - - Box 599, Auckland.

Volume 79
Number 6
December 15,
1949.
(Established 1910)

NEW ZEALAND JOURNAL OF Agriculture

Published by
Direction
of
the
Minister of Agriculture.

This month's cover

One of the most northerly points of New Zealand, Cape Reinga, is the subject of this month's cover, which has been reproduced from a painting by L. C. Mitchell and is based on a photograph by National Publicity Studios. According to Maori lore, Reinga is the departing place of spirits, who pause there to bid farewell before descending, by way of an ancient pohutukawa tree, to a cavern in the sea which is the entrance to the spirit world. Pohutukawas, which are to be seen, often hanging precariously from the cliffs, along much of the coast of the North Auckland Peninsula, are associated in the minds of New Zealanders with the Christmas season, because at that time the trees carry their masses of dark crimson flowers. The timber has been used in boatmaking since the earliest days of settlement.

New Zealand Department of Agriculture

HEAD OFFICE:
Dominion Farmers' Institute Building,
Featherston Street, Wellington.

DIRECTOR-GENERAL:
E. J. Fawcett

ASSISTANT DIRECTOR-GENERAL:
R. B. Tennent

DIVISIONAL DIRECTORS:
Animal Research .. .. .. J. F. Filmer
Dairy .. .. H. A. Foy
Extension .. .. P. W. Smallfield
Horticulture .. .. A. M. W. Greig
Livestock .. .. .. W. C. Barry
Editor: G. J. Neale

TABLE OF CONTENTS

Departmental Service to Horticulture Industry 531
Care of Livestock during January 532
Seed Production in New Zealand: Grass and Clover Seed Certification .. .. .. J. H. Claridge .. 533
The Home Garden .. .. S. O. Gillard .. 539
Dairy Produce Graded for Export 544
Use of Electric Fence in Feeding off Saved Pastures .. .. J. M. Hopkins .. 545
Applying the Principles of Poultry Breeding .. F. C. Bobby .. 547
Farming Methods on the Danthonia Hills of Hawkes Bay .. .. R. P. Hill 551
Improvement of Bee Stocks in New Zealand .. T. S. Winter .. 553
Harvesting and Marketing Cut Flowers .. C. G. Aldridge .. 555
Poultry Diseases Caused by Mould and Yeast Infections .. .. R. M. Salisbury .. 558
Pre-lambing Shearing of Ewes .. .. .. G. R. Mackintosh .. 559
Establishment of Paspalum: Lupin Varieties 561
The Green Vegetable Bug *Nezara viridula* .. R. A. Cumber .. 563
Care of Pigs During Summer .. .. .. I. H. Owtram .. 565
The Production of Pasture Seed in Canterbury J. G. Slater .. 569
The Use of Reinforcing and Boxing in Preparing Concrete .. .. H. T. W. Eggers .. 571
Household Poultry .. .. W. L. McIver .. 577
Hydraulically-operated Glasshouse Ventilators .. J. A. Cederman .. 583
Home-made Potato Bagger .. .. .. A. J. Ebert .. 585
Show Dates 586
Patents for Inventions Connected with Farming Activities .. .. F. C. Korrick .. 587
Grading Points for Export Butter and Cheese 588
Prevention of Pig Losses on the Farm 589
Domestic Beekeeping .. .. R. Goddard .. 595
The Flower Garden .. .. M. J. Barnett .. 597
Meteorological Records for October 602
The Role of Play in Children's Lives .. .. Dorothy Johnson .. 603
Party Savouries .. .. Norma K. Metson .. 607
A Smocked Summer Frock for a Small Girl .. Eva Topping .. 611
The Museums of New Zealand .. .. .. Enid B. V. Phillips .. 615
Strawberries are Ripe Again .. .. .. Eva Topping .. 619
Volume Index 623

SUBSCRIPTION RATES

The "Journal" is issued monthly. The subscription within New Zealand is 2s. 6d a year; the overseas subscription is 5s. The "Journal" may be ordered from any bookseller or newsagent, or direct from any office of the Department of Agriculture. Individual copies are available at 3d. a copy, post free.

COPYRIGHT PROVISIONS

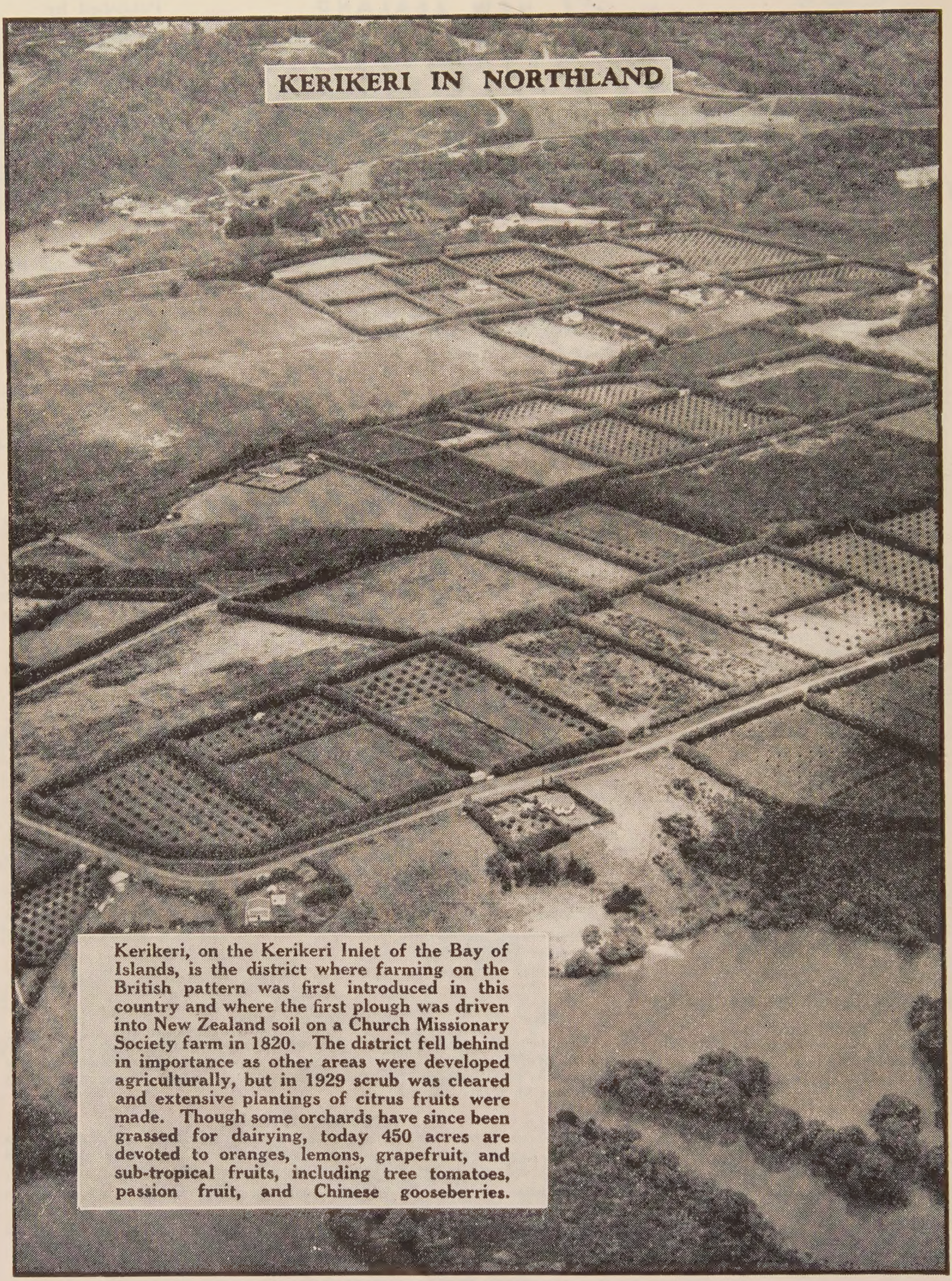
The articles in the "Journal" of the Department of Agriculture of New Zealand are copyright. Proprietors of newspapers and periodicals wishing to republish matter are at liberty to do so, **provided both the "Journal" and author are acknowledged.**

The Minister of Agriculture does not accept responsibility for any of the private and trade advertisements included in this publication.

All correspondence relating to the "Journal" should be addressed to the Editor, "The New Zealand Journal of Agriculture," Box 3004, Wellington.

REGISTERED AT THE G.P.O., WELLINGTON, AS A MAGAZINE.

KERIKERI IN NORTHLAND



Kerikeri, on the Kerikeri Inlet of the Bay of Islands, is the district where farming on the British pattern was first introduced in this country and where the first plough was driven into New Zealand soil on a Church Missionary Society farm in 1820. The district fell behind in importance as other areas were developed agriculturally, but in 1929 scrub was cleared and extensive plantings of citrus fruits were made. Though some orchards have since been grassed for dairying, today 450 acres are devoted to oranges, lemons, grapefruit, and sub-tropical fruits, including tree tomatoes, passion fruit, and Chinese gooseberries.

[*V. O. Browne photo.*

Departmental Service to Horticulture Industry

THE impact of the Second World War had a marked effect on some aspects of horticultural production in New Zealand. The export of apples and pears to the United Kingdom was cut off and New Zealand had to reorganise and stimulate vegetable production to meet the requirements of the Allies in the Pacific as well as of the civilian population. The "Dig for Victory" campaigns aroused further interest in home gardening. The result has been a marked increase of interest in horticulture in all its aspects, and the backing and assistance of the Government have been shown in a practical manner by a larger grant to the Royal New Zealand Institute of Horticulture and the reorganisation of the Horticulture Division of the Department of Agriculture.

Functions of Division

That Division has two main functions, inspectorial and advisory, both designed to assist in the sound economic development of horticultural production.

The inspectorial service is concerned primarily with the prevention, control, and eradication of disease. It begins with port inspectors, whose duties are to prevent more diseases from gaining entry to New Zealand; continues with inspection of plant nurseries and orchards; and ends with inspection of produce in wholesale markets and retail shops. In addition the Division provides a service to marketing organisations by the supply of regular crop estimates and the grading of products. It maintains a list of those engaged in fruit and vegetable production and collects tax from these producers on behalf of fruit-growing and commercial gardening organisations.

The Division's advisory work constitutes a free extension service to all horticulturists, provided through "The Journal of Agriculture," bulletins, lectures, shows, field days and demonstrations, and personal visits by advisory officers, who are stationed at practically all centres where some aspect of horticultural work is of importance. In this branch of its work the Division is closely associated with growers' organisations. It is also represented on boards or committees concerned with production and marketing.

Reorganisation of Work

To enable it to play an even more efficient part in the more certain future gained through assured returns for certain products, such as apples, pears, and lemons, the Horticulture Division has been reorganised during the past year. The principal change has been a complete separation of the inspectorial and advisory services in practically all districts, the two phases of work being co-ordinated at the administrative level. The administrative section consists of a Director and Assistant Director in Wellington and four superintendents stationed in Auckland, Palmerston North, Nelson, and Dunedin. The inspectorial staff consists of 38 Horticultural Inspectors in the districts and a Principal Horticultural Inspector in Wellington.

Specialist Officers to be Appointed

The advisory officers stationed throughout the Dominion and known as Orchard, Vegetable, or Horticultural Instructors in future will concentrate on advisory work alone. To assemble and condense the vast amount of horticultural literature now available, to keep in close touch with research stations, to study economic problems, and to maintain liaison with marketing organisations, 13 specialist officers are being appointed to concentrate on different branches of fruit growing. These men, some of whom have arrived recently from overseas, will include specialists in pip, stone, berry, and citrus fruits, grapes, vegetables, and general horticulture.

The policy of the Division is reviewed regularly at quarterly meetings of superintendents in Wellington. An endeavour is being made to reduce the number of statistical returns from producers and divisional officers, to encourage decentralisation, and to maintain uniform interpretation of grading standards and administrative actions.

Confidence in the Future

There is no doubt of the great advances—technically, culturally, and economically—which have been made in horticulture in recent years, and this reorganisation of the Horticulture Division is evidence that the Department is determined that nothing shall stand in the way of further progress. If the admirable degree of unity existing among growers can be accompanied by close co-operation with Departmental officers who are working for the benefit of the industry, it is certain that horticultural production, commercial or aesthetic, is on a sound foundation.

CARE OF LIVESTOCK DURING JANUARY

Contributed by the Animal Research Division.

LAMB WEANING

WEANING is an important stage in the life of a lamb and special care at this time will be well repaid. Long-woolled lambs should be shorn and all others crutched. Weaning is the most important time for drenching against worms and this is especially necessary in wet summers. A full dose of 20 grammes of phenothiazine should be given. If fattening crops are not available, lambs should be drafted into "clean" paddocks after drenching. For this purpose hay or silage aftermath is excellent. Lambs should never be weaned into paddocks in which ewes and lambs have been grazed during the previous month.

* * *

EWE CULLING

After weaning the ewes should be gone through carefully to select those which require culling. Teeth, feet, and wool should be examined carefully, while special attention should be paid to udders and teats, and ewes should be culled if they have defective udders or very large or damaged teats, as the lambs of such ewes often die from starvation before they are a week old. Condition is a poor guide for culling, as ewes which have not reared a lamb are always in the best condition.

* * *

SHEEP DIPPING

Modern sheep dips are so effective that the eradication of lice and ticks should be quite feasible. Best results, however, will be achieved only if the instructions for mixing and replenishing dips are followed accurately. Carelessness in dipping can cause disastrous losses. If sheep are dipped off the shears, shear cuts are liable to become infected and deaths from blood poisoning may occur. These can be prevented by vaccinating with blackleg vaccine at least a fortnight before dipping. The vaccine is available through the Department of Agriculture's Veterinarians or Inspectors of Stock.

* * *

ST. JOHN'S WORT MAKES DIPPING DANGEROUS

Sheep that eat St. John's wort become sensitive to sunlight, and scabs develop on the ears, face, and back. If such sheep are dipped, they take convulsions and may be drowned. If possible, sheep should be grazed on country free from St. John's wort for several weeks before dipping. If this is not possible, dip on dull days only.

* * *

LAMB-FATTENING FODDERS

Rape should not be grazed until the leaves show a purplish tinge. "Unripe" rape does not fatten so quickly and seems to "scald" more readily. Best results are probably obtained by grazing in breaks which last the lambs about a week. As it is false economy to keep lambs on a break until the last leaf is eaten, move them on while they are still getting a full feed. The paddocks can be cleaned up with ewes. Run-offs have little to recommend them and unless they contain good pasture they will depress the lambs' rate of growth. If hay is fed, it must be of the very best quality. Thousand-headed kale is splendid lamb-fattening fodder, but because it is relatively unpalatable it must be managed properly and always fed in small breaks and grazed only lightly before the lambs are moved on to the next break. Never use a run-off. Treated in this way the kale makes excellent regrowth and can be regrazed several times, and, if necessary, the grazing can be extended into autumn and winter.

* * *

FOOT-ROT ERADICATION

Campaigns for foot-rot eradication should be started as soon as lambs have been weaned. Once foot-rot has been eradicated from a flock it does not recur unless it is re-introduced from outside. The Department of Agriculture's Bulletin No. 325, "Foot-rot in Sheep can be Eradicated," gives full instructions for eradicating foot-rot from a flock.

* * *

ERGOTISED GRASS MAKES DANGEROUS HAY

A recent occurrence of serious lameness in cattle caused by eating hay heavily infested with ergot emphasises the danger of ergotised hay. Such hay can be easily recognised by the presence of the black ergots which replace the seeds of rye-grass and other grasses. Where ergot is known to occur hay should be made before the grasses have time to seed.

SEED PRODUCTION IN NEW ZEALAND

Grass and Clover Seed Certification

By J. H. CLARIDGE, Superintendent of the Seed Industry, Department of Agriculture, Wellington.

"WHAT has been the main contribution to pasture improvement in recent years?" If this question were addressed to many New Zealand farmers, their answer doubtless would be "seed certification." But is this really the correct answer? Only in so far as a seed certification scheme enables seed to be certified and provides a means of identifying type or strain which cannot be recognised from an examination of the seed itself. In the series of articles on seed production in New Zealand which has appeared in recent issues of "The New Zealand Journal of Agriculture" frequent reference has been made to seed certification. In this article of the series the scheme as a whole is described and its effect on pasture production discussed.

An officer of the New Zealand Department of Agriculture inspecting a perennial ryegrass seed crop for certification purposes.

TWENTY years ago the Department of Agriculture introduced a scheme of certification covering grass and clover seeds. Before that certain farmers claimed superior results with seed from certain districts—Hawkes Bay, Poverty Bay, and Sandon ryegrasses for instance were recognised in some quarters as being better in production and permanence than ryegrasses from other districts; cocksfoot seed from Akaroa had already gained a reputation both locally and overseas. The superiority of seeds of certain origin was not generally recognised, however, nor were those who had formed opinions for themselves always able to purchase seed of the origin they preferred. The buyer was unable to obtain an assurance that any line of seed was what it was claimed to be.

Disquieting Situation

During the 1920's information was gradually becoming available from the results of investigation into pasture plants. This disclosed a very disquieting situation. Very few good lines of perennial ryegrass existed outside the three districts already mentioned, and even within these areas lines of poor type could be found.

The final product. After machine dressing, the sacks are sealed and tagged as illustrated and a sample of the seed is drawn for the official purity and germination certificate.

A really satisfactory line of Italian ryegrass could not be located anywhere—the best lines were only fair; the worst were hybrid types, which were sold either as Italian or as perennial ryegrass, depending on the market. They possessed none of the good qualities of either Italian or perennial reygrass, but behaved in a manner far inferior to either species. Much seed was sown as Western Wolths, but a genuine line of this variety could not be found; it was just another name for Italian ryegrass.

There did appear to be a degree of uniformity in lines of cocksfoot seed, but as many tons of seed of Danish origin had been imported from time to time, there were grave doubts that all lines finally would prove to be of the strain originating on Banks Peninsula.

Browntop was found to be uneven in type, due, on the one hand, to mixture and hybridisation with other species of *Agrostis* and, on the other, to the development of specific regional strains.

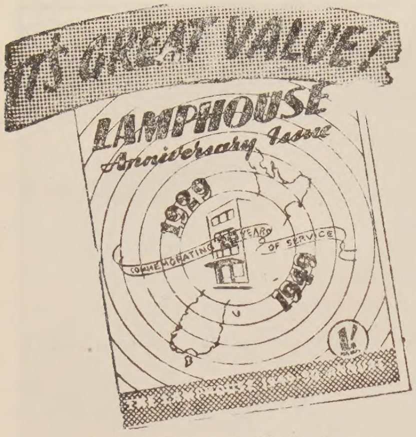
The descriptive terms applied to lines of red clover seed appeared to have no real merit. Cowgrass contained the same range of plant types as giant red clover, and in similar proportions, and buyers were misled by the attempts to create distinct types by the use of different names. At this stage Montgomery red clover had not been introduced into New Zealand and all lines of locally-grown red clover were very similar in composition.

The position regarding white clover was also obscure. Some areas were located in which a truly permanent, leafy, and high-producing strain was flourishing, but in many areas, particularly in arable districts, white clover had deteriorated virtually to an annual. This type of plant had low production and its claim to permanence was based on its ability to re-establish each season by seeding.

Isolation of Superior Strains

The picture of pasture plants in New Zealand before the introduction of seed certification was certainly far from rosy, though there were bright spots. Some good lines of perennial ryegrass and white clover could be found, and nowhere in seed-producing areas did it appear that Danish cocksfoot had become established. Though local strains of Italian ryegrass were so mediocre, New Zealand was fortunate in receiving from Europe two or three parcels of

COPIES STILL AVAILABLE!!
NEW ZEALAND'S BIG RADIO BOOK!



Over 400 Illustrations!

Copies of "THE LAMPHOUSE 1949-50 ANNUAL"

On Sale Now!

CATALOGUE SECTION:

Radio and Electrical Parts — Radio Kits — Record Changers — Amplifiers — Radio Sets — Test Equipment — Valves — Hardware — Washer Boilers — Ironers — Toasters — Jugs — Vacuum Cleaners, etc., etc. — PLUS

BIG WAR SURPLUS SECTION!!

Apart from the Catalogue Section, illustrating hundreds of bargain lines available from The Lamphouse, the Annual contains an up-to-date Station Chart of all the main Radio Stations in the world. Also included is a log of all New Zealand and Australian Stations, giving their frequency and power. There are articles on how a novice without previous experience can construct either a 5-valve Radio, a 3-valve Radio or a Portable Receiver. Just as long as you can use a soldering iron and a screwdriver and can count up to 30 you can build any one of these Radios. Numerous other constructional articles and circuits.

Costs over 2/7 per copy to produce, but costs you only
1/-

Plus Postage, 3d.

Mail Coupon Today!

"THE LAMPHOUSE,"
11 Manners Street, Wellington, C.1.

Dear Sirs,—Please post immediately a copy of the 1949-50 LAMPHOUSE ANNUAL to the address given below. I enclose One Shilling and Threepence (1/3 in Stamps—Postal Note) to cover the cost 1/-, and postage, etc., 3d.

NAME..

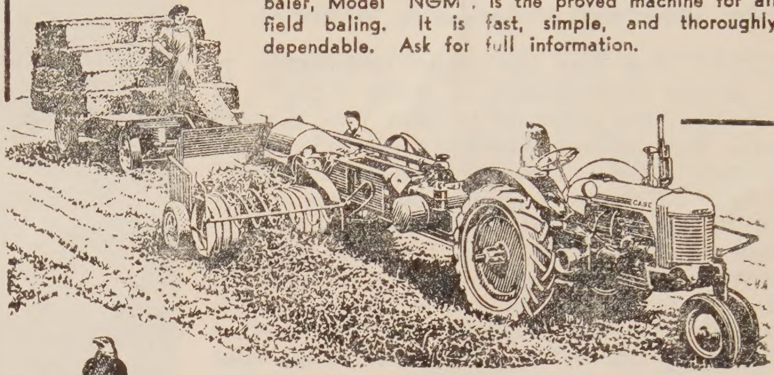
ADDRESS...

....J.

(Print clearly in BLOCK LETTERS)

The MODERN WAY to Handle Hay Crops

Baling from the cured windrow is the modern way to handle hay crops. It saves labour and time, preserves extra feeding value. The Case Sliced-Hay Pick-Up baler, Model "NGM", is the proved machine for all field baling. It is fast, simple, and thoroughly dependable. Ask for full information.



Distributors—
JOHN CHAMBERS
& SON, LIMITED,
Sole N.Z. Agents.

CASE

Auckland . . Wellington . . Christchurch . . Dunedin . . Invercargill . . Timaru . . Hamilton . . Palmerston North . . New Plymouth . . Ashburton

defeat the Blowfly

with

SHELL DEFIANCE *Blowfly Oil*

(Registered pursuant to the Stock Remedies Act, 1934)

To prevent blowfly strike, keep the wool short where soiling is likely, and apply SHELL DEFIANCE BLOWFLY OIL to any injuries caused by shears, lamb marking and other causes. SHELL DEFIANCE BLOWFLY OIL quickly renders the area of application immune to blowfly attack. Keep a tin handy . . . economical in use, lasting in effect.

For free, illustrated booklet, "Defeat the Blowfly," write to your nearest depot.

You can be sure of SHELL

SHELL

THE SHELL COMPANY OF NEW ZEALAND LIMITED
(Incorporated in England)

Italian ryegrass seed of very good type. There were large areas of browntop of pure and uniform type which were capable of producing seed ideal for incorporation in lawn grass mixtures and, at least, there was no great variation in red clover types.

It is true that even in the best lines of pasture species a considerable range of type could be seen in individual plants. Though under plot conditions these differences passed quite unnoticed, they were all too apparent when species were grown out as individuals. This weakness proved to be a blessing, as it enabled superior plant strains of all New Zealand's main pasture species to be isolated. This work led to the development of pedigree strains, which today play such an important part in New Zealand grassland farming.

In other countries work on pasture species has been undertaken and the discoveries made have been similar to those in New Zealand, but in no other country have these discoveries been extended so far into standard farming practices as they have in New Zealand. The reason for this is undoubtedly that in New Zealand a means—seed certification—was developed which enabled the findings and results of research into pasture plants to be carried right through to the practical farmer on his own land. That is the real purpose of the scheme of seed certification, which was first introduced to meet the demand for better seed potatoes and seed wheat, but was rapidly modified to meet, first, the necessity for identifying seed of superior natural strains of pasture plants and, later, the seed of pedigree strains as these were evolved.

What is really meant by the value of seed certification is the value of the strains of seeds which are recognised under the certification scheme.

Operation of Scheme

Though the scheme of seed certification in New Zealand is operated by the Department of Agriculture as an impartial body to give the seed buyer an assurance of the strain of seed he is purchasing, its success has resulted from the close co-operation of three parties: The farmer growing the seed, the merchant who does the cleaning and marketing of it, and the officer of the Department of Agriculture responsible for the certification of it. Seed certification is not operated under any Act or Regulation; it is controlled by the Department of Agriculture, but depends for its success upon the goodwill of all co-operating parties. Experience over the 20 years the scheme has been operating proves that the present method of administering it is the most satisfactory.

The aim of any certification scheme is to give the buyer of seed an assurance regarding some point of quality which cannot be determined readily by an examination of the seed itself, and it is widely recognised that strain in pasture plants cannot be so determined. This places the purchaser at a disadvantage, as hardly ever is he in a position to observe, even less to evaluate, the plants from which the seed is saved. The certification scheme provides, in the interests of the buyer, for the strain of plant to be determined satisfactorily and for the resultant seed to be identified under seal until the time comes for it to be sown for further pasture establishment.

The variation between individual plants in natural strains of perennial ryegrass is shown in this illustration. Across the centre of the photograph is a row of plants of pedigree strain.

Stages in Certification

The scheme varies with the particular species under consideration. In general the seed-producing area is registered, the origin of the seed sown on the area is identified, and the type or strain of plant growing on the area confirmed by a field inspection at the appropriate stage of growth. After the seed crop is harvested the sacks are branded and temporarily sealed, pending machine dressing of the seed. The cleaning of the seed is carried out under supervision after which the sacks are tagged with labels bearing the identification of the seed and are again sealed. At this stage all the sacks of each line are sampled by an officer of the Department of Agriculture. Samples are examined for purity and germination and certificates relating to these factors are issued to the owner of the seed. The samples are also submitted to any plot or laboratory test which may be considered desirable to confirm the plant type of the seed certified.

White clover was the first pasture plant to be included in the certification scheme. In 1929 seed of this species was certified on the basis of the age of the producing pasture. The following season perennial ryegrass was included and at intervals cocksfoot, browntop, Italian ryegrass, Montgomery red clover, cowgrass, short-rotation ryegrass, subterranean clover, and timothy have been added to the list of Certified pasture seeds. Except in the case of short-rotation ryegrass and timothy, natural strains have formed the basic material for the production of Certified seed, and in the case of browntop and subterranean clover natural strains are still the only ones certified. In all other species pedigree strains have been evolved and play a very important part in the production of Certified seed.

Selection and Breeding Programme

Coincident with the introduction in 1929 of a scheme of seed certification based on natural strains of grasses and clovers a programme of selection and breeding of the main species of pasture plants was started by the Grasslands Division of the Department of Scientific and Industrial Research. By the time the first selected material or "pedigree" strain was ready for release in 1935 seed certification of natural strains had become firmly established and the benefits of an independent means of evaluation of plant type were widely appreciated.

It was at this stage of the development of the New Zealand certification scheme that a very important decision had to be made. Should the certification of pedigree and natural strains be carried on along parallel lines or should the pedigree strains be superimposed on the natural strains, the former gradually replacing the latter and they in turn being replaced by later selections of pedigree strains as these became available? After the fullest deliberation, during which all aspects of the matter were reviewed, it was decided that the latter method of handling should be adopted.

This decision was an important one. It virtually decreed that pedigree strains under all conditions in New Zealand were superior to natural strains.

It simplified the procedure of seed production because different strains of the same species were not produced under a parallel certification procedure. It meant that certain natural strains, which even before the scheme began were recognised as being of high merit and which later had received the official endorsement of certification, would be relegated to a very minor place. This, in turn, produced certain repercussions. First from farmers in districts where superior natural strains were to be found (the effect of the policy regarding these strains can be readily appreciated); second, from certain farmers in some districts who were emphatic that the Certified natural strains were superior to the pedigree, just as certain farmers claimed that uncertified strains regarded officially as inferior actually were giving better results than Certified natural strains.

It was conceded that under certain conditions of climate and management the pedigree strains might not give the best results, but experience showed that production in such instances was not, in any case, at its maximum and that a change of farm management associated with the use of pedigree strains would lead to better results than in the past. The few and isolated cases which might not comply with the general position were regarded as quite inadequate to justify the maintenance of parallel schemes of seed production for both pedigree and natural strains of each species. In the adoption of this policy a very big responsibility was placed on the organisations which were responsible for the production and testing of the various pedigree strains before their release. It was essential, also, that a regular supply of nucleus material should be available for multiplication in order that a steady flow of seed would be available for recognition under the certification scheme.

Change Made Gradually

The practical problem of implementing the decision to base certification on pedigree strains had also to be tackled. It was apparent that a sudden and complete change from natural to pedigree strain could not be brought about without completely disorganising the market which had already been built up for Certified seeds. The alteration had to be made gradually. The progress which has been made to date with the change from natural to pedigree strains has been dependent upon the date the pedigree strain first became available for release and the rapidity with which the already-established areas of natural strains could be replaced. Replacement has been accomplished more speedily with annual than with perennial species.

In the certification of natural strains certain precautions were necessary to ensure that plant type was maintained. In general, two classes of seed were recognised: "Mother" was one and "Permanent Pasture" or "Commercial" the other. (The term "Commercial" has now been dropped in favour of the term "Standard.") In addition, with the more-perennial species a subclass of "Permanent Pasture" ("Permanent Pasture First Harvest") was recognised. "Mother" seed was the produce of areas showing the highest strain purity, with the added proviso in the case of other-than-annual species that the producing area had passed through a specified number of harvest seasons. "Permanent Pasture" or "Commercial" seed was saved from areas showing a lower strain purity or not having the necessary age qualification, while "First Harvest" seed was that obtained from the first crop of a newly-established area the type of which had not been confirmed by any plot test. Under the scheme a certain amount of variation between individual crops was always apparent, and as a result the proportion of rejections was correspondingly high.

In the change-over to pedigree strains the first step has been to introduce two further certification classes ("Government Stock" and "Pedigree") of higher merit than the classes already established. In the first stages the already-established scheme of certification was maintained and, in addition, supplies of seed of pedigree strains, when sufficient to release into commerce, were distributed as Certified "Government Stock" seed. Areas sown with this seed produced Certified "Pedigree" seed which, in turn, was used to sow areas eligible to produce Certified "Mother" seed.

At this stage in the certification scheme, then, Certified "Mother" seed might have been of natural or of pedigree strain. The next step has been to restrict to "Permanent Pasture" or "Standard" class the produce of areas sown with "Mother" seed of either natural or pedigree strain. In the more perennial types, a further step in the change-over has been the degrading to "Permanent Pasture" of areas of natural strain which had earlier been accepted for the production of Certified "Mother" seed.

Basis of Certification

The change in the basis of certification from natural to pedigree strain was carried out rapidly with Italian ryegrass, and today all Italian ryegrass seed certified is of pedigree strain. A similar position has also been reached with Montgomery red clover. In the case of perennial ryegrass and white clover the change has been much slower, but in these species all seeds certified in the "Mother" and higher classes is now of pedigree strain. The complete replacement of natural strains of perennial ryegrass and white clover by pedigree strains is retarded because laboratory tests are used as the sole basis of certification in the lowest class (Permanent Pasture). With cowgrass (broad red clover) and cocksfoot little progress in the change-over is yet apparent. On the other hand, all Certified short-rotation ryegrass obviously is of the pedigree strain. In the case of timothy an overseas pedigree strain is now being replaced by a locally-selected strain

The significance of the various classes of Certified seed is shown in the accompanying diagram. Though the various classes are of little importance to the farmer desiring to establish a pasture for grazing purposes only, they are of paramount importance for areas intended for further seed production, as they provide for the most rapid multiplication with the minimum of contamination from the "nucleus" stage until all the Certified seed produced is of that strain.

1. **SEED OF SELECTED STRAINS**
supplied by Grasslands Division of Department of Scientific and Industrial Research

to be sown out for further seed production under contract to the Department of Agriculture

produces

2. **CERTIFIED GOVERNMENT STOCK SEED**
which is distributed by the Department of Agriculture through mercantile channels to selected seed producers

to be sown out primarily for further seed production

produces

3. **CERTIFIED PEDIGREE SEED**
which is marketed in New Zealand through mercantile channels

to be sown out largely for further seed production

produces

4. **CERTIFIED MOTHER SEED**
which is marketed in New Zealand and overseas through mercantile channels

to be sown out in New Zealand largely on areas which are likely to be utilised for further seed production

produces

5 **CERTIFIED PERMANENT PASTURE SEED**
or
CERTIFIED STANDARD SEED
which is marketed in New Zealand and overseas through mercantile channels.

Certified Government Stock seed is distributed to selected farmers primarily for further seed production. Certified Pedigree seed is freely marketable within New Zealand, but its export is not permitted. This class of seed is also intended primarily for further seed production. Subject to the meeting of local requirements, Certified Mother seed and Certified Permanent Pasture or Standard seed are permitted full freedom of market in any overseas country.

The quantity of Certified Government Stock seed released each year is regulated, as far as practicable, to an amount considered ample to enable the total New Zealand seed crop to be produced from that release within three further stages of multiplication. The demand for Government Stock seed is usually far in excess of the quantity available, but the demand is regarded as an economic one and is not in any way related to the real purpose of the release of this class of seed.

Improved Pedigree Strains

When an improved pedigree strain of any species is produced it is fed in at the top of the certification scheme as Certified Government Stock seed. From there it permeates into all classes of Certified seed and any radical change in procedure or classification of areas is thus unnecessary. In the intervening years the standard of the pedigree strain is maintained by annual release of re-selected material from the breeder.

With very few exceptions the strain purity of all Certified seeds, irrespective of class, is uniformly high. To that degree it is immaterial to the grazing farmer what class of Certified seed he sows, except that in some species he must purchase a higher class to be certain of obtaining seed of pedigree strain. The certification classes and their relationship are, however, of great importance to the seed grower, as they show the number of stages by which each class of seed is removed from the breeder and result in the most rapid multiplication to the stage where all Certified seed represents the latest possible release.

The procedure adopted has simplified the whole question of maintaining strain purity and has made it possible to eliminate age qualification, previously essential in certain species. Further, it has enabled a much higher general standard to be maintained in all Certified seed without the disturbing feature of a relatively high proportion of crops rejected from certification.

Samples of Certified white clover seed under plot test at Palmerston North.

The four recognised classes of Certified seed provide a clearly-defined channel of multiplication of the pedigree strain from the breeders' hands to the ultimate user. They do not necessarily represent seed of differing qualities; rather, they represent seed having a quality as even throughout as possible, and they indicate the stage of multiplication of the particular material. To that extent no tests could differentiate between, say, Italian ryegrass certified as Pedigree seed and much of that certified as Standard seed. The justification for the classes and the conditions of certification within them is that they permit rapid multiplication and correspondingly less opportunity for contamination during multiplication. In addition, by a simple procedure, strains of most species at a certain stage removed from the original selection automatically pass outside the scope of the certification scheme.

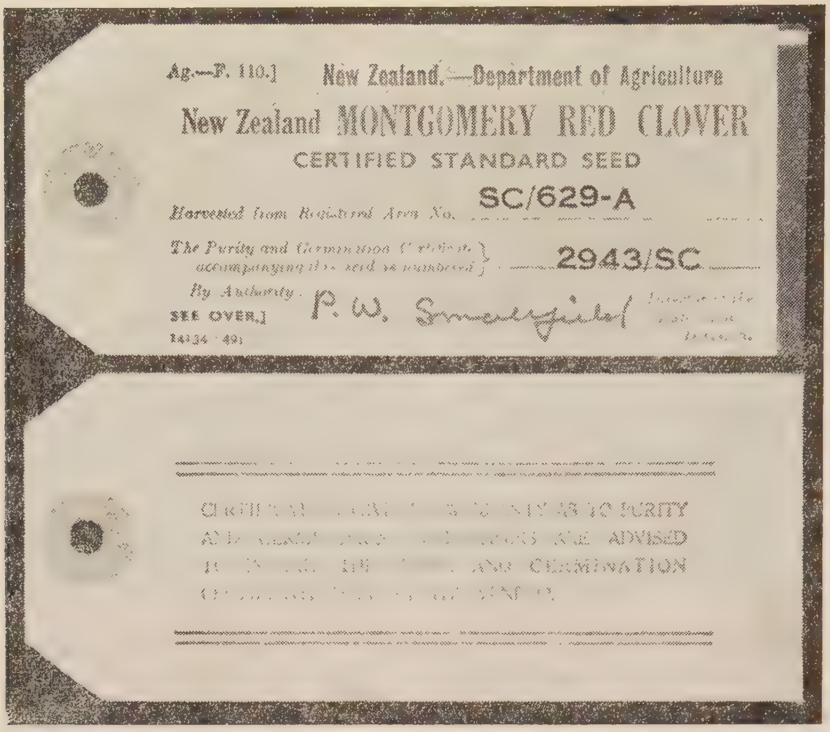
The first and most obvious effect on farming of the availability of Certified grass and clover seeds has been that purchasers have been given an assurance that the seed they buy is of good strain. In addition a channel has been provided whereby the work of the plant breeder in developing pedigree strains is passed on to the farming community in a rapid and assured manner.

A knowledge of strain coupled with a knowledge of purity and germination of the seed has enabled a more accurate evaluation of the seed to be made, and buying and selling have been undertaken with more confidence. Though it is almost impossible to measure the effect of the scheme on individual species, a comparison of the position in regard to some species before the scheme was instituted and the position today is given below.

Perennial ryegrass: Before the introduction of the scheme 25 per cent. of the perennial ryegrass seed harvested might have been expected to reach the certification standard of the first years of certification. Today when a much higher standard applies 70 per cent. of the perennial ryegrass seed produced is actually certified, and it is not difficult to believe that the quality of much of the remainder is not far short of the present-day standard for certification.

Italian ryegrass: When certification was first introduced no local strains reached the standard of certification set. Today 70 per cent. of the harvest is recognised under certification. This is all of pedigree strain which is superior even to the imported strains which provided the first material to be certified.

Before leaving the paddock sacks containing Certified seed are branded and sealed to preserve the identity of the contents.



Ag.—F. 110.] New Zealand.—Department of Agriculture

New Zealand MONTGOMERY RED CLOVER

CERTIFIED STANDARD SEED

Harvested from Registered Area No. SC/629-A

The Purity and Germination Certificate accompanying this seed is numbered 2943/SC

By Authority. P. W. Smallfield

SEE OVER.]

14134-49]

Front and back views of a specimen of the tags which are attached to bags of Certified seed.

Short-rotation ryegrass: Only the certification scheme has made it possible to preserve with certainty the identity of short-rotation ryegrass.

White clover: When a laboratory test for white clover certification was first introduced in 1937 the total production amounted to 485 tons, of which 40 per cent. was accepted for certification. In 1947 production reached 2648 tons, yet, despite a higher certification standard, 70 per cent. of the crop was certified.

Montgomery red clover: This seed would not have been identifiable from cowgrass without a scheme, such as that provided by seed certification, under which it could be recognised.

There are other less obvious, though no less important, effects of the seed certification scheme. Before the certification scheme was introduced it was essential with perennial species, if quality was to be maintained, to harvest seed from old pastures. This uneconomic process can be eliminated under a certification scheme extending from a nucleus supply of seed derived from regularly-selected material of pedigree strain, and farmers have been able to take the fullest advantage of the heavier and cleaner seed crops harvested from younger pastures. The undesirable practice of saving seed from pastures of mixed ryegrass species has been almost entirely eliminated. Seed production under certification has become primarily an activity of the arable areas where crops and pastures are associated in the farming practice. The saving of seed, though not a primary activity on most farms, is nevertheless a planned one.

In general, the whole outlook on pasture seed harvesting has been lifted from that of a haphazard, catch-crop undertaking to be indulged in at the whim of the farmer and the season to that of an operation which warrants careful attention and planning. This change in the attitude to seed production, though perhaps affected to some extent by other factors, has been the result largely of the direct influence of the certification scheme.

Effect on Pastures

From the pasture aspect, also, certification has wrought some changes and pasture-management practices have had to be adjusted to obtain the best results from the improved strains. Though the farmer is the best judge of the improvement in quality of pastures due to the use of Certified seeds, it can be said that on some farms the use of Certified seeds has revolutionised farming practices. Nowhere is this more apparent than in Canterbury, where, instead of the run-out pastures or perhaps bare paddocks which demanded reploughing within three or four years of sowing down, good pastures can now be maintained for a number of years. The reduction in the acreage of arable crops in this district, though not perhaps a direct result of the use of Certified seeds, has been possible because pastures established with these seeds have not required such frequent renewal. Conversely, the increased grain yields obtained when pastures established with Certified seeds are broken up are a reflection of the increase in fertility which can be obtained through the heavier stocking possible on a good pasture.

That the United Kingdom gives preference to New Zealand Certified seeds and goes so far as to prohibit imports of uncertified seed of some species is additional evidence of the value to New Zealand of Certified seeds and of the certification scheme generally.

If a farmer buys Certified seed, however, he must not expect, automatically, perfection in all respects. Certification refers only to the strain of plant and gives no assurance as to the purity or germination of the seed certified.

Purity, or rather impurity, is a complex factor unrelated to strain and requires individual interpretation, depending upon the conditions under which the particular line of seed is to be sown; germination is a factor which can vary from one period to another in the one line of seed and it is materially affected by storage conditions. Neither of these factors can be incorporated satisfactorily in a certification scheme designed primarily to identify strain, but both can be determined by an analysis of a seed sample drawn at any time. As a matter of routine all lines of Certified seed are sampled by an official of the Department of Agriculture and examined for purity and germination, while every certification tag carries a warning to the purchaser to inspect the certificate of that analysis before completing the purchase of his seed. The certification tag is endorsed with the identity of the line of seed, the same identity appearing on the corresponding certificate of analysis covering the purity and germination of the seed. A certification insert slip is also included inside the sack, when the identity of the seed is an essential prerequisite to the future certification of an area sown with that seed.

The New Zealand certification scheme, introduced originally to identify seed of superior natural strains, has been modified to meet the different requirements of seed of pedigree strains. It is undertaken to provide the buyer with an assurance as to the strain of the seed and not for any specific benefit it may confer upon the grower of the seed.

The strains of grass and clover seed under certification have been selected for conditions in New Zealand, because New Zealand is still the biggest user of the seed it produces and it is only fortuitously that New Zealand strains may meet the needs of overseas countries also—that they do so is shown by the export seed trade, valued today at about £2,000,000. However, the scheme of seed certification takes its place in New Zealand agriculture essentially as an aid in lifting the production of animal foodstuffs to the highest level.

"JOURNAL" SUBSCRIPTIONS

Subscribers writing to the Department of Agriculture about their subscriptions to "The New Zealand Journal of Agriculture" are asked to send an address label clipped from a recent "Journal" envelope or wrapper. This will enable the information to be found quickly and thus ensure a prompt reply. Inquiries concerning subscriptions should be addressed to the nearest office of the Department of Agriculture.

THE HOME GARDEN IN JANUARY

By S. O. GILLARD, Vegetable Instructor,
Department of Agriculture, Auckland.

IN January the flush of the growing season is over and the garden filled with newly-planted, growing, and maturing crops, but because the garden is fully planted it does not mean that further attention is not required; on the contrary there is much to be done. The hoe and other cultivating implements should be used frequently to keep weed growth down and conserve soil moisture. Weed control is much easier at this time of the year because weeds which earlier in the season had to be gathered up after cultivation will now die rapidly in the hot sun after hoeing. Weeds not only rob the plants of food and soil moisture and are hosts for disease, but if allowed to develop their seed will increase the weed population next season.

DURING January care should be taken to see that the soil moisture is sufficient for good growth, especially for such crops as lettuce, peas, beans, and celery, these vegetables being influenced to a great extent by the moisture content of the soil. Asparagus beds and pumpkin and melon crops will require hand weeding.

At this period of the year liquid manure can be applied with advantage to most crops. Liquid manure can be made from animal manure tied in a piece of sacking and suspended in water; about 2lb. of reasonably fresh manure to a gallon of water will make a suitable mixture. Excellent liquid manure can also be made with soot (1lb. to a gallon of water and treated in the same manner as animal manure). Nitrate of soda and sulphate of ammonia, 1oz. of either to 4 gallons of water, are also useful liquid manures. If the soil is very dry, it is advisable to water the soil before applying the liquid manure.

Tomato plants should be tied to supports and the lateral growths removed regularly as they develop. In districts where blight is experienced the plants should be sprayed regularly.

Protecting Potato Crops

Growing potato crops should be kept earthed up to protect them from the potato moth, which is usually very active during this period. For the control of late blight it will be necessary to spray at frequent intervals with Bordeaux mixture (a certified copper oxychloride may be used in the place of Bordeaux).

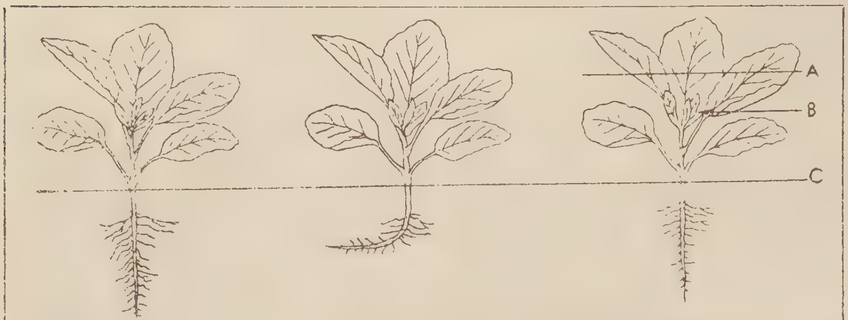
Mature potato crops should not be left in the soil after the tops have died down. At this period of the year crops left for any length of time after the skins of the tubers have become firm are liable to be damaged by sunbaking and to attack from the potato tuber moth. If the soil has been dry, the tubers may start quickly into second growth when rain is experienced.

Kumara runners should be lifted periodically to prevent them attaching themselves to the soil. If this is done regularly, the vines will not mat together and are much easier to turn.

The soil should be drawn up to sweet corn as it grows to help support the plant, and where exposed to strong winds plants should be supported with stakes. As the cobs form, a watch should be kept for signs of caterpillars which may be attacking the cobs and are usually found at the silk end of the cob. For control apply D.D.T. as a spray or dust.

Heading photograph by Sparrow Industrial Pictures Ltd.

THE HOME GARDEN IN JANUARY



Transplanting brassicas. Left—The correct way to plant. Middle—The incorrect method. The tap root is bent and this retards the flow of sap to the plant and results in slow growth and shallow root development, which are a disadvantage in dry soils. Right—The amount of transpiration can be reduced and plants kept from drooping unduly by cutting off the outer leaves. A—The level to which leaves should be cut. B—Young leaves in the centre, which should not be touched. C—Depth to which plants should be set.

All members of the brassica family will need protection from the caterpillars of the white butterfly and diamond-backed moth or aphides and should be dusted or sprayed frequently with recommended specifics.

In southern districts January is the latest it is advisable to sow peas, french beans, carrots, and swedes to mature before the cold weather sets in, but for most northern districts these vegetables may still be planted during February and March.

Provided soil moisture can be maintained, spinach, silver beet, beetroot, turnip, radish, lettuce, and kohl rabi may be sown now and celery and lettuce can be planted out.

In Auckland and surrounding localities celery and parsnip seed can still be sown and sweet corn planted before the middle of the month.

Winter Greens

A continuous supply of vegetables is the aim of all keen gardeners, and to secure an unbroken supply of winter greens it will be necessary to plant now. Cabbage, cauliflower, broccoli, curly kale, brussels sprouts, and leeks can be grown in all districts for winter supply.

Onion crops should be nearing maturity. If good bulbs have formed and the tops are still green, ripening may be speeded up by bending the neck of the onion stalk; this retards the flow of sap from the roots, causing quicker development of the bulb.

To promote lateral growth, which bears the fruit, leading growth of pumpkins, marrows, cucumbers, water melons, and rock melons should be stopped by pinching off the terminal shoot when leaders have run about 6 to 8ft. To induce lateral growths of rock melons pinch out the leader as soon as three or four rough leaves have grown and meantime keep the laterals from bearing fruit. When the four main branches are well grown the fruit-bearing laterals can be allowed to develop and flower, and when the fruit is set, the laterals must be stopped at one or two leaves beyond it. When the fruit is about 1in. long thin out to about six or seven to each plant and pinch off all subsequent blossoms as well as any weak or subsequent growths. This procedure limits the number of fruits, but improves the size which the fruits will attain.

Cucumbers should be pinched out when the leading growths have made four rough leaves, to induce lateral growths; these in turn should be pinched back to develop the fruit-bearing laterals, and as soon as the fruit has formed pinch these back also at two joints beyond the fruit. Continue this treatment as long as necessary to increase the bearing productivity of the plants. Cucumbers and marrows should be picked as soon as they attain a useable size. If left on the vine after reaching maturity they lose flavour and seriously retard the development of the younger fruits.

The shallot crop should now be reaching maturity and this condition can be recognised by the withering of the tops. Where shallots have not yet reached maturity, weeds should be removed. Weed control is particularly important, as weeds not only use up available plant food, but when the ground is wet tend to make conditions favourable for fungous diseases to attack the bulbs. When mature the clusters of bulbs should be pulled up, spread in a cool place to dry off thoroughly, and then stored. If carefully handled and stored in a dry place where fresh air is constantly circulating, shallots will keep in perfect condition well on toward the end of the year.

Beetroot

Types of beetroot and varieties of each type (with the maturity period in days of the variety shown in parentheses) are as follows:—

Flat: Egyptian, Early Wonder (52).

Round or globular: Crimson Globe, Derwent Globe, Detroit Dark Red (60).

Half-long: Obelisk (65).

Long: Long Smooth Red, Long Dark Blood (78).

Beetroot, which are grown for table use in nearly all home gardens, are a useful vegetable in a number of ways over a long period. Early thinnings can be used as greens. The quality of beet is best before they have reached maturity, and when fully grown they should be pulled and stored, as they have a tendency to become stringy and lose much of their sweet taste if left in the soil. Properly stored beetroot will keep in good condition for several months. The leaf growth of beetroot which are to be stored should be twisted off, leaving the leaf stalks attached to the bulb; leaves should not be cut off, because this will cause the beet to bleed and will result in poor flesh colour when beet are cooked. Store in a reasonably moist, cool, airy place by stacking the beet in a heap with the outside layers placed leaf end out. The heap should not be more than 2ft. high and 4ft. wide, or it may heat. Cover the heap with straw to prevent the beet from shrivelling.

Rapid growth, for which a fertile soil sufficiently friable to foster the proper development of the roots is required, is essential in producing good-quality beet. A fine, smooth seedbed is advisable and it facilitates even germination and makes the task of cultivation and weeding easier. Soil that forms a crust is undesirable because of the difficulty in getting the beet to come up.

As beetroot is fairly sensitive to soil acidity, lime, preferably applied some time previously, is usually necessary. Where the soil has not been limed recently an application of carbonate of lime may be made at the rate of 2 to 4oz. per square yard. Fertiliser

[*Sparrow Industrial Pictures Ltd. photo.*

If the onion bulbs are full grown, ripening may be induced by bending the tops. This practice is recommended only when a prolonged spell of wet weather is being experienced when the onions are ready to harvest. It is better to allow the crop to ripen naturally before it is pulled out of the soil.

containing blood and bone 1 part, superphosphate 2 parts, and sulphate of potash 1/20 part (all by weight) may be applied at the rate of 2 to 4oz. per square yard and will be suitable for most soils. It is preferable for beet to be planted without additional fertiliser in land previously occupied by a crop which has been heavily manured.

Seed should be sown thinly ½in. deep in rows 12in. apart and the plants later thinned to 3 to 4in. apart in the rows.

Recommended varieties of beetroot for January planting are Early Wonder and Derwent Globe.

Kohl Rabi (Turnip-rooted Cabbage)

Kohl rabi resembles an above-ground turnip; the fleshy, edible portion is an enlargement of the stem and it is a highly nutritive vegetable combining the flavour of cabbage and turnip. The large, bulb-like stem is the part generally used, although the leaves may be cut and used like cabbage.

Kohl rabi should be grown quickly and used when the bulbs are from 3 to 4in. in diameter, as if left to grow to maturity, bulbs become tough and stringy. Kohl rabi may be sown from early spring to February, but January sowing is most favoured, as the crop then matures in late autumn when other vegetables are perhaps a little scarce. It does best in a well-worked deep loam. Like cabbage it will not do well on an acid soil, and if this condition exists, it should be corrected by applying carbonate of lime (4oz. to a square yard).

As kohl rabi does not transplant readily, it is best sown direct in the permanent position. Sow seed thinly ½in. deep in rows 18in. apart and thin plants to 6 to 8in. in the rows. Fertiliser containing blood and bone 2 parts, superphosphate 1 part, and sulphate of potash 1/20 part (all by weight) should be applied at the rate of 4oz. per square yard.

In cultivation be careful not to cover soil over the hearts of the plants and not to cover the bulbs. The bulb-like stems should be ready for use about 4 months after the seed was sown.

[*Sparrow Industrial Pictures Ltd. photo.*

Savoy cabbages are really a winter-maturing crop and will tolerate cold conditions better than other varieties.

Varieties: A very popular variety is White Vienna, an early dwarf excellent for home gardens. The bulbs are globular and very light green and the flesh is clear white, tender, and crisp. Purple Vienna takes about a week longer to mature than the white variety; the bulb and leaves are purplish and the flesh greenish white.

Lettuce

Lettuce, possibly the most popular and widely grown green vegetable, is used mainly for salads. Although a succession may be provided the whole year by sowing every 4 weeks, it is rather difficult to produce at this period of the year. The most common cause of lettuce failing to heart during hot weather is lack of moisture at some stage of growth causing a check and consequent promotion of seed-stem development. Unless plants are grown rapidly they tend to be tough and bitter; this is particularly so in summer and autumn.

A rich, friable soil is the most suitable. This should be well dug and enriched with compost or well-rotted stable or farmyard manure. If the soil condition is poor, the fertility should be increased by an application of equal parts of dried blood manure and superphosphate at the rate of 8oz. per square yard. Lettuce may be sown direct in the rows in the garden from October (later in the south) to March. At other times it is preferable to raise the seedlings in warm, sheltered beds and transplant them. The soil should be worked to a fine tilth before sowing the seed, and if the soil is dry, it should be watered thoroughly. When it has drained sufficiently to work, drills may be prepared and the seed sown thinly ¼in. deep in rows 12in. apart. The plants should be thinned to 6 to 9in. apart in the rows as soon as possible.

Lettuce should not be watered overhead in bright sunshine during hot weather as this may cause scorching of the tender leaves. This scorching may be followed by secondary decay or fungous rots. Irrigation is preferable in hot weather.

Watering may be necessary every 6 to 7 days on sandy soils and every 10 days on heavy soils during hot weather. Watering should cease as the plants near maturity to prevent the heads from splitting. Each watering should be sufficiently heavy to soak the soil several inches deep; light waterings are likely to do more harm than good.

Recommended varieties for sowing in very warm conditions are Great Lakes and Imperial 847; and for average conditions Neapolitan (Webbs Wonderful) and Champion Cabbage.

[*Sparrow Industrial Pictures Ltd. photo.*

Cauliflowers are not difficult to grow where conditions are right.

THE HOME GARDEN IN JANUARY

[*Sparrow Industrial Pictures Ltd. photo.*

To produce good-quality lettuce an abundance of plant food, together with adequate moisture and good growing conditions, is essential.

Potatoes

In northern districts not subject to early frosts a small planting may be made of early maturing potatoes such as Arran Banner, Supreme, or Epicure. Planting at this time of the year may not always be successful, as success depends upon subsequent rains and warm weather, but if the ground is available, a trial is worthwhile.

Peas

Peas, one of the most popular vegetables, can still be sown in most districts, provided an early maturing variety is chosen. Though they prefer cool conditions, peas will not grow in cold weather. They do best in fertile, moist, deeply cultivated soils and usually do well after a crop that was well manured. Where it is intended to grow peas on soils low in fertility a mixture of equal parts by weight of blood and bone and superphosphate and 1/20 part of sulphate of potash applied at 4oz. per square yard and thoroughly worked into the soil will be beneficial. Nitrogenous manures should be used sparingly for this crop as they promote excessive leaf and stem growth and make the plant more susceptible to attack by disease. Peas do not do well on acid soils and this condition should be rectified by applying a dressing of carbonate of lime at 4oz. per square yard. Drills spaced 2ft. 6in. apart may be drawn 3in. deep with a hoe and the peas scattered the width of the drill; allow from 1 to 2in. between the seeds. As the plants grow the soil may be drawn up to them to provide support.

Suitable varieties for sowing now are: Earlycrop, W. F. Massey, Little Marvel, and Utility.

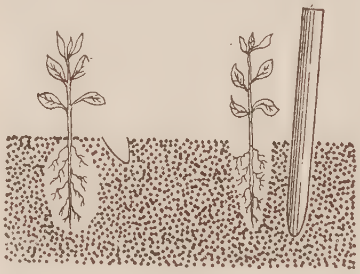
Tampala

Tampala is a vegetable that does well if sown now. It is frost tender and will flourish in hot, dry weather when it is rather difficult to produce spinach, and it does not bolt to seed so readily. The plants take about 6 to 8 weeks to reach a usable size and are ready for use as greens when 6in. high, at which stage the entire plant may be pulled and cooked, leaves and stalks together, like spinach, which it resembles in flavour, or it may be left to grow 3ft. or so tall, and repeated pickings can be made. Greens gathered from tall plants are free from the soil splashes so common on spinach.

Tampala requires a rich, well-worked soil which has previously received a dressing of lime. For most soils a good general mixture is equal parts of blood and bone and superphosphate plus sulphate of potash equal to 20 per cent. of the weight of the first two manures. This should be broadcast and worked into the soil several days before sowing at the rate of 4oz. per square yard.

Sow the seed thinly ¼in. deep in rows 18in. apart and later thin the plants from 4 to 12in. apart in the rows. The wider spacings are necessary when the plants are to be left to grow to their full size.

Culture of celery, celeriac, leeks, parsnips, broccoli, cauliflower, kale, savoy cabbage, carrots, brussels sprouts, and beans was dealt with in last month's "Journal."



Cross-section of land illustrating the use of the dibble in setting plants. Left—Improperly set plant. The dibble has been inserted in such a way that only the top portion of the soil has been pressed against the plant, leaving air spaces round the roots. Right—Showing how the dibble should be inserted so that the soil can be well pressed around the roots.

Control of Pests and Diseases

Most home gardeners have experienced the disappointment of seeing their vegetable crops attacked and spoilt by insects and diseases. After spending time and effort in producing good plants the gardener should be prepared to deal effectively with attacks by pests and diseases.

Many gardeners have gained from experience a knowledge of successful cultural practices and produce excellent crops, but fail to protect them adequately from attack by insects and diseases because of a lack of knowledge of diseases and control measures. In these and succeeding home garden notes it is intended to deal briefly with a number of the more common diseases and pests of the home garden and to describe control measures.

Insect Pests

For general purposes the insects which attack vegetable crops may be classified into four groups: Sucking insects, leaf-feeding insects, boring insects, and underground insects.

Sucking insects: In the group classified as sucking insects are those which have the mouth parts modified to enable them to suck up the sap of the plant. The plant tissues may be punctured and the sap withdrawn, or the surface of the tissue may be rasped by the insect and the exuded sap sucked up. Examples of insects which puncture the plant tissues are black and green aphides and the green vegetable bug. Thrips and red mite are examples of insects which rasp plant tissue. As the insects in this group do not eat the surface tissue of the plant, they cannot be controlled by poisonous sprays, and materials are used which cause paralysis or suffocation and death by contact. Nicotine sulphate is the most generally used contact spray. Thrips may be controlled by nicotine sulphate, but are more satisfactorily controlled by D.D.T.

Leaf-feeding insects: In the group classified as leaf-feeding insects are caterpillars, beetles, grubs, crickets, etc. These insects feed by biting off pieces of plant tissue, which are masticated and swallowed by the insect. They are readily controlled by a stomach poison such as lead arsenate which is applied to the plant surface and is ingested by the insects when feeding. D.D.T., which is not a stomach poison but causes paralysis and death by contact, has also proved successful in controlling the insects in this group.

Boring insects tunnel into the roots, stems, branches, and tubers of plants. Common examples are the potato tuber moth and the tomato stem borer. Control is best effected by the use of D.D.T.

Underground insects include cut worms, wireworms, and eelworms, which attack the plant roots or underground stems of plants. Control measures include soil sterilisation and the use of poison baits and D.D.T.

Diseases

Most plant diseases are caused by fungi, bacteria, or viruses. It is not intended here to deal with troubles caused by faulty nutrition and growing conditions.

Fungous diseases are the most common diseases affecting vegetables and under favourable conditions they reproduce rapidly by means of minute spores, which may be spread by wind or water to other plants. A fungous disease common on potatoes and tomatoes in most home gardens, especially in northern districts where warm, moist conditions prevail, is late blight (*Phytophthora infestans*). The rapidity with which this disease may spread under favourable conditions is well known to most home gardeners. As warmth and moisture favour the increase of fungous spores, fungous diseases are more prevalent in warm climates subjected to frequent rains and high humidity; late blight, for instance, is a very troublesome disease in the Auckland district, but is little known in Canterbury. Fungous diseases may be carried over from one year to the next in the form of thick-walled resting spores in decayed parts of plants, on seeds, or in the soil. Control of fungous disease is effected by the use of fungicide sprays such as copper compounds and sulphurs. Garden sanitation plays an important part in the control of fungous diseases.

Bacterial diseases of vegetables are less common, but several such as halo blight of beans and bacterial canker of tomatoes are fairly well known to home gardeners. The bacteria causing these diseases increase with great rapidity under favourable conditions of warmth and moisture. Control measures for bacterial diseases include spraying with copper compounds, the use of clean seed, and the destruction of affected plants. Garden sanitation is again important.

Virus diseases are common on vegetables such as tomatoes, potatoes, lettuces, peas, and cucumbers and other cucurbits. Virus diseases do not multiply and spread in the manner of fungi or bacterial diseases, nor can they be seen under the microscope. They may be described as infective principles in the sap of the plant, which, when transferred from an affected plant to a healthy plant, cause the healthy plant to show similar symptoms to the affected one. Aphides and thrips are common vectors of virus diseases, and some virus diseases are spread by man when handling affected and clean plants. Virus diseases cannot be controlled directly by spraying, although the spread of those which are carried by aphides and thrips may be reduced if sprays are used to control the insect vectors. Principal measures of control include the early detection of the disease and the rogueing and destruction of affected plants, and the use of clean seed and resistant varieties. Hands and garden tools should be washed after handling affected plants. Most virus diseases have wide host ranges and many common weeds are hosts. All weed hosts around the garden should be destroyed.

Control Measures

Methods of combating insects and diseases include the use of sprays, dusts, baits, soil fumigants, garden sanitation, and seed treatments.

Sprays: These may be divided into two main groups, insecticides and fungicides, and the insecticides may be further divided into stomach poisons and contact sprays.

Lead arsenate is the commonest stomach poison employed and is used for the control of leaf-feeding insects. The general rate of application is 2oz. to 5 gallons of water.

[*Sparrow Industrial Pictures Ltd. photo.*

Tampala is a good substitute for spinach and will withstand hot, dry conditions.

Contact sprays include nicotine sulphate and D.D.T. Nicotine sulphate is used to control diamond-backed moth on brassicas and green and black aphides and cabbage aphis. The recommended strength is 1 fl. oz. to 5 gallons of water. If nicotine sulphate is used alone, it requires the addition of an activator such as soft soap, 2oz. to 5 gallons, to render it more effective. The soft soap should be dissolved in a quart of hot water and the requisite amount of nicotine sulphate added, and the mixture left to stand 15 minutes before adding the balance of water required.

D.D.T. may be used to control thrips and most of the leaf-feeding insects. For spraying purposes a wettable powder, which is available in two strengths, 50 per cent. and 25 per cent. D.D.T., is used. The recommended dosage is 4/5oz. of the 50 per cent. powder to 5 gallons of water; if the 25 per cent. powder is used, double the quantity recommended for the 50 per cent. powder should be used. Care should be taken not to use D.D.T. on the edible portions of plants within 2 to 3 weeks of harvesting unless the produce is washed before use.

Copper compounds such as Bordeaux and copper oxychloride and sulphur such as lime sulphur and colloidal sulphur are the general fungicides in use for control of fungous diseases. The sulphur sprays are used only for the control of powdery mildews such as powdery mildew of cucumbers, peas, pumpkins, etc.

To prepare 4 gallons of Bordeaux suspend 4oz. of bluestone in muslin in ½ gallon of water in a glass, wooden, or earthernware vessel (metals should not be used); mix 5¼oz. of hydrated lime (spraying lime) with a little water; strain the lime through cheesecloth into a kerosene tin and wash the cheesecloth through with water. With the tin about three-quarters full, pour in the bluestone solution, stirring all the time. The mixture is now ready to use and should be of a good blue colour.

To test the mixture a bright, clean blade of a penknife should be dipped into it for about a minute. If the blade becomes tarnished, more hydrated lime must be added, as this condition indicates that the mixture has not neutralised sufficiently to prevent burning of the foliage.

As freshly made Bordeaux mixture soon deteriorates, it should be used

THE HOME GARDEN IN JANUARY . . .

the day it is made. It is best to pour it into the sprayer through a fine gauze strainer or muslin to prevent any grit or other impurities from clogging the nozzle.

Though none of the dry Bordeaux powders is as effective as home-made Bordeaux, they are simple to prepare and if used in sufficient quantity give quite good results. The best are certified by the Plant Diseases Division of the Department of Scientific and Industrial Research and on the label carry a warrant of certification showing the correct dilution to use, usually about 3oz. to 4 gallons of water.

Combination sprays: At times it is advisable to combine certain sprays to obtain control of both insects and a fungous disease with the one application. Bordeaux mixture and copper oxychloride can be combined with lead arsenate and D.D.T. wettable powder. Lime sulphur and lead arsenate and D.D.T. wettable powder can be combined, but when combining lead arsenate with lime sulphur, hydrated lime (twice the weight of the lead arsenate) should be added to reduce risk of burning the plant foliage.

Wetting agents: With plants such as cabbage, peas, and onions it is very difficult to get the spray application to adhere to the foliage and it is advisable to use a wetting agent. There are several good proprietary preparations, which should be used according to the manufacturer's recommendation.

Dusts: Sulphur in a finely ground form is used for the control of powdery mildew and should be applied with a dust gun to give a fine coverage just visible to the eye.

D.D.T. dusting powder is sold in several strengths and may be dusted on the foliage of the plants as directed for the control of insect pests such as tomato and sweet corn worm and white butterfly and will control the tuber moth of potatoes, slaters, wireworms, earwigs, cutworms, and many other insects.

Derris dust is blown from a dust gun or sprinkled from a container covered at the mouth with a piece of muslin on to cabbage, cauliflower, etc., for the control of white butterfly and diamond-backed moth. It kills the insects by contact and also acts as a stomach poison. It has the great advantage that in the quantities used to control insects it is harmless to humans.

Baits are used for the control of slugs and snails. There are proprietary preparations containing metaldehyde which are usually satisfactory, but if desired, baits can be made from tablets containing metaldehyde and bran, one tablet being powdered up fine and mixed with a large cup of bran. Baits are scattered over the soil or placed in small heaps. They lose their effectiveness after they have been exposed to rain.

Soil fumigants are used mainly for sterilising boxing soils for the growing of seedlings. They include formalin, which is a 40 per cent. solution of formaldehyde. For the purpose of sterilisation 1 part of formalin is added to 49 parts of water (1 pint to 6 gallons of water). The soil to be treated is spread out in an open shed and the formalin solution is watered on at the rate of 1 gallon per bushel of soil. The heap is then covered over with sacks for 48 hours to retain the volatile gas, after which the soil is turned to dry. It should not be used until all smell of formaldehyde has disappeared.

Garden sanitation: It is important that no diseased refuse or crop residues should be allowed to lie about the garden. All healthy foliage including lawn and tender hedge clippings should be composted, but remains of diseased crops should be destroyed by burning, especially diseased tomato vines, potato haulms, and pea and bean foliage which may be affected with virus and other diseases.

Seed treatments: One of the objects of seed treatment is to protect seeds from fungi and other organisms commonly present on soil which cause the seeds or young seedlings to rot before they emerge above ground and to eliminate the possibility of seed-carried diseases. Dry seed dusts may be purchased and these are simply shaken up with the seed. Most seeds purchased from seed merchants have been treated.

Satisfactory pest and disease control can be secured only by regular applications of a recommended control spray and by 100 per cent. coverage, which can be maintained only by the use of good spraying equipment.

DAIRY PRODUCE GRADED FOR EXPORT

THE following figures showing quantities of dairy produce graded for export during October and for the 3 months ended October 31, 1949, with comparative figures for the same month and 3-monthly period of last year, have been compiled by the Dairy Division of the Department of Agriculture from figures supplied by divisional officers at the various grading ports:—

BUTTER—

	Tons				Tons
Period	Creamery	Whey	Total	Percentage Inc. or dec.	Total in store at end of mth.
October, 1949	20,141	353	20,494	+9.488	23,656
October, 1948	18,391	327	18,718	—	18,291
Increase or decrease	+1,750	+26	+1,776	—	+5,365
For 3 months ended 31/10/49	45,283	732	46,015	+18.345	—
For 3 months ended 31/10/48	38,246	636	38,882	—	—
Increase or decrease	+7,037	+96	+7,133	—	—

CHEESE—

	Tons				Tons
Period	White	Coloured	Total	Percentage Inc. or dec.	Total in store at end of mth.
October, 1949	8,820	2,516	11,336	+4.662	14,357
October, 1948	10,659	172	10,831	—	14,878
Increase or decrease	—1,839	+2,344	+505	—	—521
For 3 months ended 31/10/49	15,747	4,498	20,245	+9.592	—
For 3 months ended 31/10/48	18,301	172	18,473	—	—
Increase or decrease	—2,554	+4,326	+1,772	—	—

If these figures are converted into butterfat equivalent, there is an increase of 16.768 per cent. in butterfat graded for the 3 months as compared with the corresponding period of the preceding season. It should be noted that the above figures refer only to butter and cheese graded for export, and that owing to diversions which may take place from time to time, they are not necessarily a true indication of production trends.

BOOK REVIEW

"Tomato Diseases and Pests"

"TOMATO Diseases and Pests," a booklet by officers of the Plant Diseases Division and published by the Department of Scientific and Industrial Research, will claim the interest not only of commercial tomato growers but also of every grower of tomato plants, whether indoor or outdoor, and assist them in the incessant struggle against the numerous diseases and pests to which tomatoes are susceptible.

As many of the pests described attack other vegetables and plants besides tomatoes, most gardeners will find the manual invaluable.

In this comprehensive 112-page publication the writers have dealt briefly but thoroughly with all the principal fungous diseases, including moulds and wilts, and the most common insect pests such as caterpillars, aphides, eelworms, and slugs which affect tomatoes and other plants of this kind. General descriptions and life history are given, the text being amply and well illustrated; also, for practical use, the most effective methods of control and prevention are set out, derived from the results of much research and experimental work and trials under field and laboratory conditions exhaustively carried out by skilled and experienced officers.

The latest and full information on hygienic cultural practices is given, including extraction of tomato seeds, handling of plants, spraying implements required, and fungicides and insecticides, their component parts, and how to mix and apply them.

Soil disinfection by the most modern methods is described and useful tables of diseases and their control for glasshouse and outdoor crops are given in this informative booklet, which contains much of practical value and can be recommended to all gardeners and horticultural workers.

It is available from offices of the Department of Scientific and Industrial Research at Auckland, Christchurch, and Dunedin, and the Head Office, Wellington.

—*W.T.G.*

"Tomato Diseases and Pests," Department of Scientific and Industrial Research, Wellington. 2s. 6d.

Use of Electric Fence in Feeding off Saved Pasture

By J. M. HOPKINS, Instructor in Agriculture,
Department of Agriculture, Levin.

BREAK feeding of pasture growth to dairy cows by means of the electric fence is usually practised by farmers who are milking for whole-milk supply all the year round and who have to make special provision for autumn, winter, and early-spring feed. The production of winter milk, especially where reliance is placed entirely on grass and grass products such as silage, makes it essential to use the electric fence as a means of rationing off pasture growth. The method does not call for additional labour nor is the expenditure involved unjustified.

IN obtaining the maximum return from any saved pasture growth it is necessary to break fence such feed into areas small enough for all growth to be cleaned up quickly, with a minimum of fouling by the stock. A similar procedure applies to crops which are to be break fed to stock, often by means of the electric fence—only sufficient area should be allowed for a quick and full clean-up of the break. With daily breaking of saved pasture growth fouling does not occur to any extent, as only sufficient area of grazing is allowed for the number of dairy stock to be fed.

Levin Farmer's System

A Levin farmer, Mr. W. S. Long, has adopted a method of break feeding of saved pasture growth which could be used on any dairy farm where saved grass is fed to milking dairy stock. On Mr. Long's farm no cropping is done and reliance is placed entirely on pasture growth and silage for autumn, winter, and early-spring feeding to the milking dairy herd. The aim is to have a high level of feeding right through the year, with emphasis on the production of winter milk. On the 99-acre farm between 50 and 60 cows are milked during the winter and from 150 to 180 gallons of milk per day are produced. During the past 8 seasons between 40 and 50 acres of pasture have been cut each year for silage.

Normally rationing of pasture and silage feeding are begun in late March or early April and are carried through to the end of August. Ordinary rotational grazing is practised from September onward. The particular system of rationing pasture no doubt is exceptional, but because of its general simplicity and ease of application other farmers who are supplying milk for city and town supply in winter should find it valuable.

Saving Summer and Autumn Grass

A very early start is made with the saving of pasture growth on Mr. Long's farm and normally grass saving is begun in late January or early February. In an average season the aim is to have on hand by mid-May up to 50 acres of pasture growth up to 9in. long and to have any areas which have already been fed off again making good growth. Pasture growth is built up by dropping from the normal feeding rotation any fields which can be spared. When growth in these fields is sufficiently long they are fed off daily in breaks made by employing the electric fence and the rest of the farm is spelled. Fed-off fields are cleaned up by dry stock or, if necessary, by topping them with the mower, and are again shut up.

Aluminium Wire Used

Because of its lightness and the ease with which it can be shifted, a single

Heading photograph by W. J. Neville.

FEEDING OFF SAVED PASTURE

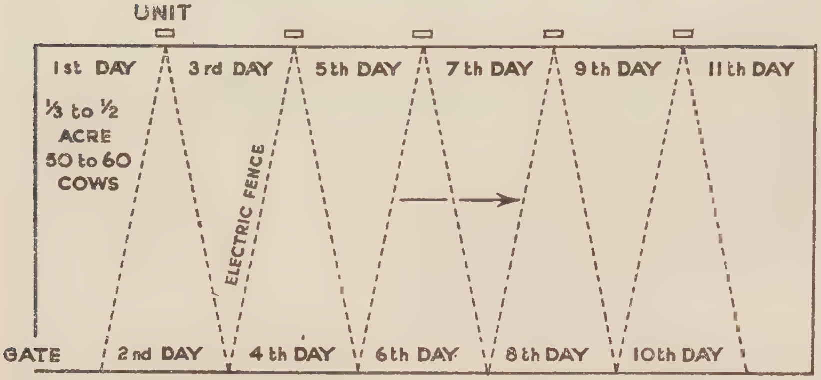


Fig. 1—Break feeding of rectangular or long-shaped fields.

aluminium barbed wire is used for break fencing fields; provided the single wire is kept tight it has been found to be sufficient to confine stock to breaks. Because the wire must be kept tight, it is always strained on to new breaks and, in fact, if no other fencing is being done, the strainer is left on the electric fence wire. The electric fence unit is of light, waterproof construction and all equipment, including the battery, can be carried in one hand. Square fencing battens have been used for stakes and have been found to last for long periods if 2in. lengths of 2in. piping are knocked over the tops of the battens. The pipe lengths prevent battens from splitting and cracking when being driven into the ground. On flat fencing 1 batten every 1¼ chains has been found to be ample.

In breaking off pasture on rectangular fields a start is always made at a gate end, with the electric wire running at any desired angle to the far side of the field. This gives a triangular break of suitable size (Fig. 1). Mr. Long fences off breaks of 1/3 to ½ acre, which have been found to give an ideal ration for 50 to 60 cows for 1 day's feeding—that is, of pasture growth up to 9in. long. For the second day's feeding the fence is shifted so that the angle of the fence in relation to the gate side of the field is the opposite of that of the first day. The positioning of the fence is altered in this way each day until the entire field has been rationed off. Silage may be fed out on the grazed breaks or it may be fed out on any other fields which have been completely rationed off.

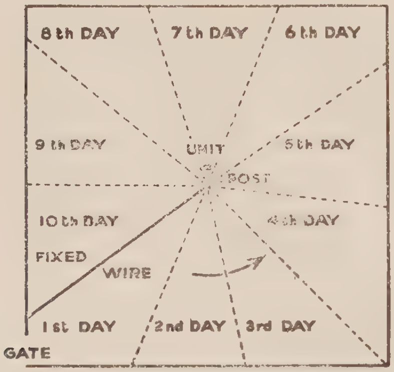


Fig. 2—Break feeding of square fields.

With a square field a post is sunk in the centre of the field and a fixed wire strained from the post to the boundary fence. The unit is then placed at the post and the required ration of grass is given each day by moving the electric wire in a clockwise or anticlockwise direction round the field as desired (Fig. 2).

Irregular-shaped fields can be break fenced in the same manner as square fields, but it will be necessary to determine the best position for the fixed post (Fig. 3).

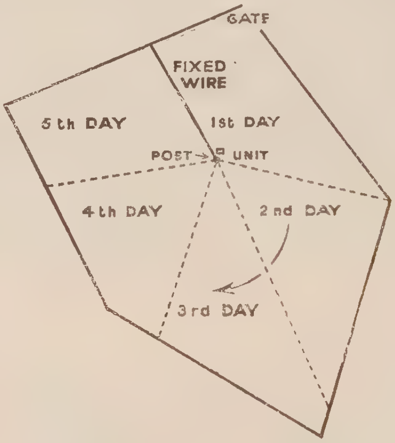


Fig. 3—Break feeding of irregular-shaped fields.

The main requirements in break feeding of saved pasture are a light and simply-constructed electric fence unit which can be moved easily and a system embodying the quick, easy shifting of the break fence itself. Both these points are important and they are essential where a daily ration of saved pasture is fed to dairy cows. A light aluminium barbed wire break fence can be shifted by one man in a few minutes.

With the number of dairy farmers supplying winter milk for town supply increasing each year, more attention must be given by these farmers to the provision of feed for winter milkers. Farmers use various methods for feeding off saved pasture growth, but often do not use break fencing. The system described, which is simple and easy to operate, could be adopted more widely; already several farmers in the Levin district are following it.

Federation of Young Farmers' Clubs

AFTER debating the subject freely for a number of years the New Zealand Federation of Young Farmers' Clubs has, with certain restrictions, agreed to allow country girls to be admitted into clubs. The restrictions, as decided at a recent meeting of the Dominion Executive Committee, are that girls are to be admitted only where there is an insufficient number to form a country girls' club (the constitution of the New Zealand Federation of Country Girls' Clubs lays down that 5 active members are the minimum number needed to form a club); that the girls are to become "independent" members of the Federation of Country Girls' Clubs and "associate" members of the young farmers' club; that the minimum age for girls admitted to young farmers' clubs is to be 16 years; and that the club concerned may decide whether or not it will admit girls.

Land Settlement

The federation's land settlement subcommittee has prepared in draft form for the consideration of all units a land settlement scheme based on the land settlement policy already agreed to in general principle by the Government. After the draft has been considered by all units and redrafted by the subcommittee the final scheme will be put before the appropriate authorities.

Realising that the scheme cannot be put into action until the needs of land settlement under rehabilitation have been met, the federation is seeking, as a measure of temporary relief, that the Government should put into immediate operation a scheme whereby, for the next 4 years, young men of proven experience, who were appealed for and retained in the farming industry during the war and who can find suitable farms, be provided with the financial assistance envisaged under the land settlement scheme.

Activities

The 1949 national debating contest was won by Te Puna Club (Auckland Council) when, at the final held at Ashburton, Woodlands Club (Otago-Southland Council) was defeated by a narrow margin.

Scargill-Omihi Club (North Canterbury) won the first national Y.F.C. miniature rifle shooting contest. Interest in the contest was keen throughout the Dominion, 146 teams from 35 districts being entered. The winning team scored 387 out of a possible 400 points.

The Lincoln College Old Students' Association scholarship for 1950 has been awarded to W. B. Browne, Upper Hutt Club. The runner-up, S. Murray, Cheviot Club, has been granted a similar scholarship by the Canterbury Frozen Meat and Dairy Produce Export Co. Ltd.

SHOW DATES CORRECTION

Dates of the Christchurch Flock Ram Fair shown on page 586 as February 16 and 17 should read March 16 and 17.

Applying the Principles of Poultry Breeding

PRINCIPLES and practices involved in poultry breeding have been described in previous articles in this series by F. C. Bobby, Superintendent, Poultry Industry, Department of Agriculture, Wellington, but so far only a limited attempt has been made to apply these principles to methods on the farm. This article, which will be continued next month, deals with the aspects of the subject and problems which face the poultry breeder. It includes a description of progeny testing, a subject much under discussion by people interested in the breeding of livestock.

IT is comparatively easy for poultry producers interested in breeding to study the fundamental principles of genetics, but putting those principles into practice with breeding birds is an entirely different problem, particularly if the poultry producer is interested mainly in raising the economic value of his flock, with increased average egg production as a major aim. The fancier, whose main objective is perfection in type and other breed characteristics in a bird has advantages over the poultry breeder interested in egg production and other factors of commercial value in that he can measure by eye the characteristics sought and include as breeders birds which carry these characteristics.

However, even the fancier cannot be sure that desirable characteristics present in the breeding male or female will be passed on to all or any of the progeny in a desirable manner. That is perhaps the major factor in breeding and is today a basic fact influencing poultry-breeding programmes for increased egg production.

Among economic characteristics desired by the commercial producer are heavy egg production, high hatchability rate, and liveability. As with those sought by the fancier, these characteristics can be measured, though not by eye, but by systems of recording, which often entail much labour, patience, and time. Furthermore, in breeding there are no short cuts to success and no golden rules which, if adhered to completely, must lead to success. Each breeder depends for success on the application of the principles of genetics, intelligent interpretation of the results obtained, and a thorough knowledge of his stock.

Difficulties to be Faced

The knowledgeable breeder selects a male bird which on sight and handling measures up to a desirable standard. The bird may be from a pen of hens known to have given good egg production, but there is no guarantee that this male will sire pullets which will give high average production. The value of that male bird as a stud breeder is not known until he has proved his worth by the class of pullet he has sired.

Similarly, a breeder may select a pullet or hen which appears to carry the characteristics of a good layer, or a hen whose pullet-year egg production has been recorded, yet again there can be no guarantee that this bird will throw pullets of high average production. Only by measuring or recording the production of those pullets is it possible to assess the true value of the hen as a breeding bird.

However, if the breeder has recorded his stock for a number of generations, so that information is available about the parentage of any breeding bird, male or female, predicting the possible value of such a bird becomes easier. Furthermore, selecting year by year what are considered to be the best birds on handling tends to maintain a standard or even to bring about some improvement.

Maintaining or Raising Production

When contemplating a breeding programme the poultry farmer must decide whether it is intended to maintain a reasonable standard of egg production or whether the object is to raise the level of production substantially. That refers not to a strictly limited number of high producers in a laying flock, but to the average production of the flock. More than one poultry breeder has won egg-laying competitions with birds giving outstanding production though on his farm the average for the rest of the pullets has hardly attained an economic level.

Statistics indicate that the average annual egg production for flocks of hens and pullets in New Zealand is about 11 dozen per bird. Without doubt there are flocks with averages well above this figure—say, 14 to 15 dozen; average production at this level has been attained by a breeding programme based mainly on selection by handling and observation, backed by first-class management at all stages. However, it is doubtful whether such flocks have shown much change in egg production over the years beyond limited fluctuations from season to season.

Progeny Testing

To make appreciable advances in egg production with such flocks and within a limited number of years it is likely that a definite programme of breeding based on progeny testing would have to be adopted. To appreciate what is envisaged it is first necessary to know what is meant by progeny testing.

The term implies assessing the worth of a male or female as a breeder by measuring the value of the progeny in terms of the characteristic for which a mating has been made—egg production, hatchability, liveability, disease resistance, or any other desirable characteristic. Not the unknown potential value but the actual breeding value of the male or female is under test—hence the terms "proven male" or "tested male."

Progeny testing takes time and labour, but if a male is found that throws progeny giving an egg average appreciably above the previous average for a flock, its value for as long as it will breed is great—far greater than that of any untried male or even an average tested male. Such males are hard to find.

The progeny testing of males entails less work than the testing of females. The male is often spoken of as being "half the breeding pen." There is little difficulty in obtaining, say, 40 or 50 pullets sired by a single male. If taken at random from all the pullets sired by a single male in a breeding season, that number of birds is a good representative sample and one which it is safe to use as a means of measuring the value of that male. A different and more difficult situation arises in the testing of females. All too often it appears possible to obtain only 4 or 5 mature pullet daughters of the hen being tested, but a sample of 8 to 10 is desirable.

Family Testing

Though testing males can lead to progress, the greatest advantages are obtained by "family testing"—that is, testing a number of females and eliminating as breeders any that do not reach a required standard.

Two highly desirable economic factors may be used for measuring the value of daughters of any hen—their rearability and their liveability as matured birds, the latter being associated with resistance to disease. Thus, if a hen's progeny suffer undue mortality during the rearing period or heavy losses during the first laying season, that hen and her progeny, male and female, should be eliminated from any future breeding pen. On the other hand, if the daughters of a hen rear well and show a low mortality rate as pullets in their first laying season, the value of the dam as a breeder may then be judged on their egg production; if it is satisfactory or obviously above the average for the strain of birds, she is valuable as a breeder for as long as she produces a reasonable number of normal hatching eggs. Furthermore, the full brothers to the pullets are more valuable than males about which little is known beyond their exterior characteristics.

Judging the value of a hen by the pullet-year records of her daughters is not as simple as it may appear, as is shown by the following figures for two hens mated to the same sire:—

Hen A, Family No. 1	**Hen B, Family No. 2**
Pullet-year egg records of daughters	
280	180
146	220
180	205
105	210
200	232
100	240

OF INTEREST TO THE FARMERS

Wool-pack Stack Covers:

	£	s.	d.		£	s.	d.
13 x 15	3	11	0	18 x 21	6	17	10
16 x 18	5	5	0	18 x 24	7	17	6
18 x 18	5	18	0	21 x 21	8	0	10
16 x 21	6	2	6	21 x 24	9	3	9
16 x 24	7	0	0				

Tarpaulins:

16oz. Green Duck	£	s.	d.	*Heavy Quality Green Canvas*	£	s.	d.
6 x 9 ...	3	6	0	6 x 9 ...	3	13	6
9 x 12 ...	6	12	0	9 x 12 ...	7	7	0
15 x 18 ...	16	10	9	15 x 18 ...	18	7	6
18 x 24 ...	26	9	0	18 x 24 ...	29	8	0

(Available in all sizes)

Cow Covers:

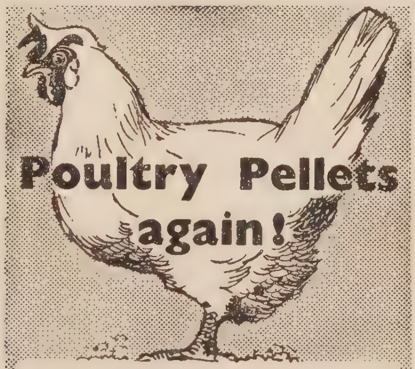
White Duck Canvas, £2/8/-.

Horse Covers:

Hack, Medium or Draught—
Flax or Canvas from £4/10/9.

Freight forward. Delivery immediate.

L. McMANUS & CO. LIMITED
223 High Street, Christchurch.
P.O. Box 710.



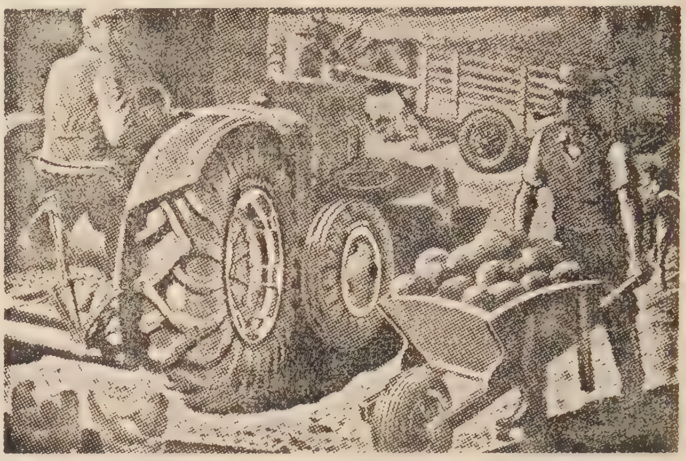
Poultry Pellets again!

Standard Mash Pelleted
with guaranteed full content of
Tomoana Meat Meal.
Save Time, avoid waste.
Order from your Produce Merchant

CHANGES OF ADDRESS OF "JOURNAL" SUBSCRIBERS

To ensure continuity of delivery of issues of the "New Zealand Journal of Agriculture" subscribers are required to give 4 weeks' notice of change of address. The old address and the new address, together with an address label clipped from a recent "Journal" envelope or wrapper, should be sent to the nearest office of the Department of Agriculture.

Tyres revolutionise Farming



To grow more food on your farm and to get more work done with less labour, fit all forms of transport with DUNLOP tyres and wheel equipment—your tractors, barrows and all your animal-drawn vehicles. DUNLOP rubber boots are a further valuable aid to farming efficiency and increased productivity. Be wise—modernise!

DUNLOP
serves Agriculture
DUNLOP NEW ZEALAND LIMITED

Because

BASIC SLAG

contains PHOSPHATES
plus minor MINERALS

it is the Tonic Fertiliser for your Pastures

An analysis of Basic Slag produced under the Thomas - Gilchrist - Bessemer process shows that besides its highly available non-acid phosphate content, Basic Slag also contains minor minerals such as iron, manganese, magnesia, chrome, etc., all necessary to keep pastures and stock in perfect health.

Order from your Fertiliser Merchant.

REGULAR SHIPMENTS ARRIVING.

FOR BIGGER — YET BETTER — PRODUCTION . . .
USE BASIC SLAG

Though hen A has produced a daughter giving 280 eggs, this bird is not nearly as valuable a breeder as hen B, the production of whose pullets is far more consistent. The results suggest that hen B is more homozygous or pure for the genetical factors affecting egg production than hen A. Though the pullet-year records of both hens may have been high and similar, it is not the egg-production record of the breeder which counts, but the average production of her daughters.

The recording of families has been described because the family method of selecting breeding birds is a sound way in which to breed for increased egg production. That it involves work, time, and patience is obvious. Maintaining a reasonable egg average in a flock by efficient management and careful selection of breeders by observation and handling is comparatively easy. The real test of a breeder comes when he endeavours to raise the standard of production to a high average level.

Characteristics to be Recorded

Before considering possible breeding programmes applying the principles and practices described it is necessary to decide what desirable characteristics of breeding stock and its progeny are to be recorded. The more important characteristics are hatchability, rearability, egg production, and adult mortality.

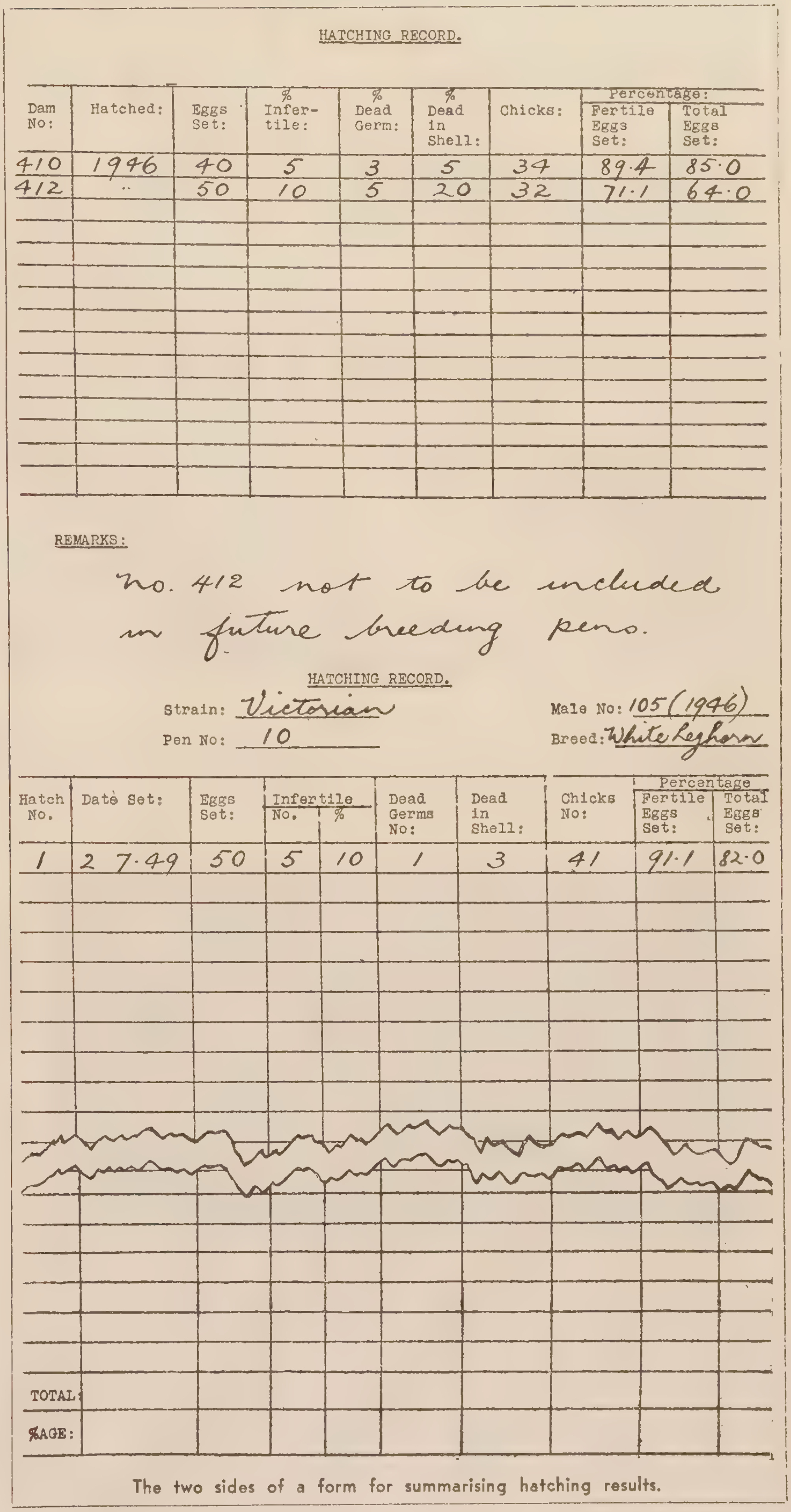
Hatchability

The collection of data about hatchability presents little difficulty but involves time and conscientiousness in recording. If it is desired to record only the general results of a pen or a number of pens of breeding hens mated to a single male in each case, it is necessary only to mark each egg laid with the pen number. Such eggs are then recorded at each stage of incubation as infertile, dead germs, dead in shell, or finally chicks hatched. If results from individual breeding females are required, the breeding birds must be trap nested and each bird's leg band number and pen recorded. A form for summarising results from individual females is illustrated. A similar type of form is necessary for recording the results of each hatch, but only numbers and not percentages need be recorded for each hatch.

The final hatching results are expressed on the forms illustrated as "Percentage of fertile eggs" and also as "Percentage of all eggs set." The former is the figure usually quoted, but the latter is of value because it gives a figure which truly represents the result—how many chicks have been obtained for every 100 eggs set.

Rearability

Data about rearability cannot be collected unless every chick hatched is toe-punched to indicate the pen (or even individual bird if desired) from which the chick came. The toe punch of a chick which dies is recorded in a book or on a sheet. Sixteen combinations of toe punches which may be used are shown on the next page; this number can be doubled if one back toe is removed, and doubled again for



HATCHING RECORD.

Dam No:	Hatched:	Eggs Set:	% Infertile:	% Dead Germ:	% Dead in Shell:	Chicks:	Percentage: Fertile Eggs Set:	Percentage: Total Eggs Set:
410	1946	40	5	3	5	34	89·4	85·0
412	"	50	10	5	20	32	71·1	64·0

REMARKS:

No. 412 not to be included in future breeding pens.

HATCHING RECORD.

Strain: Victorian
Male No: 105 (1946)
Pen No: 10
Breed: White Leghorn

Hatch No.	Date Set:	Eggs Set:	Infertile No.	Infertile %	Dead Germs No:	Dead in Shell:	Chicks No:	Percentage Fertile Eggs Set:	Percentage Total Eggs Set:
1	2 7·49	50	5	10	1	3	41	91·1	82·0
TOTAL:									
%AGE:									

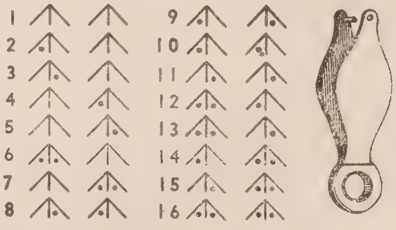
The two sides of a form for summarising hatching results.

the back toe on the other leg. The web may be slit with a pair of scissors or a knife instead of using a punch if desired. Here again recording presents no difficulties, time and conscientiousness alone being involved.

Egg Production

Egg production may be recorded or measured for individual birds or for a flock. Individual layers may be recorded by the use of trap nests where a number of pullets or hens are run in a flock. Each bird carries a numbered leg band and eggs are credited to the bird's number on specially designed sheets. An alternative method is to have a series of single pens—one for each layer, or even two layers per pen where a light- and a heavy-breed bird are run together, the difference in the colour of the eggshell denoting which bird has laid.

Trap nesting involves considerable labour, particularly during the flush season of production, and it can be recommended only where full advantage is taken of the information gathered. Trap-nest sheets afford far more information than merely the total of eggs laid during the period for which the birds are recorded. Egg sequences, winter egg production, moulting periods, and broodiness are some of the items about which trap-nest sheets can supply valuable data to the breeder. The value of individual pullet-year egg scores will be referred to when breeding programmes are discussed.



A poultry toe punch and the 16 combinations of marks which are possible with it.

The recording of egg production for a flock of layers is simple and requires little labour. A card, sheet, or egg book and the will to record daily the number of eggs produced by a flock or house of birds are the only requirements. The recording of egg totals daily and the addition of these into a total at the end of a period require little effort, but the method of interpreting the results needs more thought. Quite often the average number of eggs per bird is calculated on the basis of the number of birds laying during the year, dead birds and culls being deducted from the number at the start of the season. However, the average which gives a true picture of the performance of a flock takes into account mortality and culling, and this figure is obtained when the total number of eggs produced is divided by the original number of birds in the flock. This is known as the hen-house average and is the figure by which the real economic value of a flock may be measured. It includes the good and the poor producer and also reflects the great economic value of liveability in the birds in the flock. Flock-house or hen-house averages compared year by year present a true picture of ground gained or lost. They are also a means of measuring the value of a male bird where the first stages of progeny testing are carried out.

Approximate averages based on total eggs produced and the number of birds left at the end of a laying season may look well, but all too often they are highly misleading as to the economic value of the stock.

It is recommended that any production figures recorded should be kept for a maximum period of 48 weeks and for the same period each year for comparison purposes—for example, March 1 to January 31. Every producer is faced annually with finding room for the current season's pullets. Culling starts, flocks are broken up, and houses are amalgamated to make room for these annual replacements, and the keeping of accurate egg tallies by houses or flocks becomes impossible. Therefore it is better to choose a reasonable period for accurate recording and to use the same period each year, whether it be 40, 44, or 48 weeks. Accurate data can then be kept and compared year by year to measure progress.

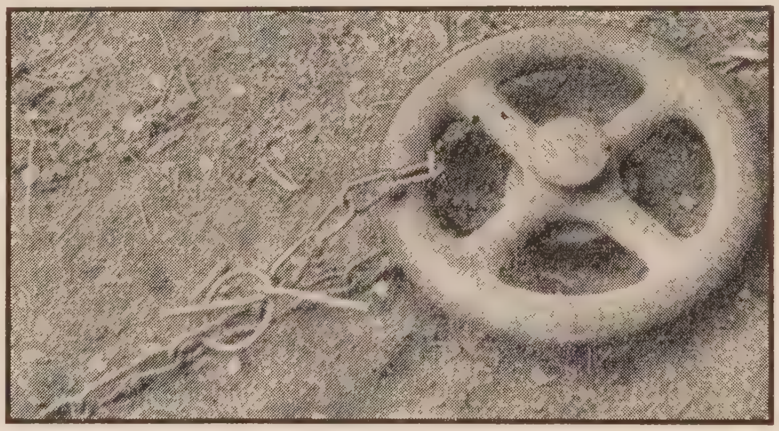
Mortality

Many producers would receive an unpleasant shock if accurate figures about losses from day-old birds until the final disposal of stock were recorded on their farms. In any progressive programme of breeding such figures are essential in measuring the value of a strain of birds or the breeding worth of a male bird. They are of greatest value where the cause of death, more particularly in adult stock, is known in each case, but this is rarely practicable for the average breeder of poultry.

Nevertheless, where a serious attempt is being made to improve the economic value of a flock, records of losses of both young and adult stock are essential. The method of recording such mortality may be comparatively simple and designed by the breeder to meet his own requirements.

A Dog-chain Fastening Which Will Not Tangle

DESPITE their value on the farm, many dogs are not adequately sheltered, and the methods by which they are attached to their kennels often leave much to be desired. Frequently a dog is seen with his chain so completely wound about an old stake, derelict farm implement, or broken-down kennel that freedom of movement is impossible. Such treatment is not conducive to good manners and obedience.



The illustration shows how by the use of discarded implement parts Mr. A. V. King, of Clydevale, Otago, is able to tether his dog securely by its kennel and allow the maximum amount of freedom. A dog attached to such a device cannot become "hung up." The swivel ring is some 6in. in diameter and revolves on a bolt 18in. long driven through it into the ground. Between the ground and the lower surface of the wheel is a washer 2in. in diameter and 2in. thick, which acts as a bearing and enables the wheel to revolve smoothly.

—*J. G. RICHARDS, Instructor in Agriculture,*
Department of Agriculture, Balclutha.

Farming Methods on the Danthonia Hills of Hawkes Bay

FOR many years danthonia was the most important pasture plant on much of the hill country of Hawkes Bay. Properties carrying swards consisting chiefly of danthonia were usually large, the labour requirement was relatively low, weeds were not of great importance, and problems of management were different from those of the present. During the past 20 years much of this hill country has been topdressed, surface sown with clovers, and subjected to entirely different types of management, resulting in very different problems. This article by R. P. Hill, Fields Instructor, Department of Agriculture, Hastings, deals with a danthonia sheep farm and describes the types of pasture and stock carried as well as the management, which in many respects is intermediate between that of heavily-topdressed farms and that of the older type of danthonia runs.

THE soil of the farm is of a type which could reasonably be expected to grow subterranean clover and give a good response to topdressing with phosphates. Situated in the low-rainfall belt and subject to dry conditions but with a mild climate, the property is about 1000 acres in extent and consists of moderately steep to steep hills, practically all unploughable but with small areas of flat land interspersed throughout, estimated at 80 acres. The soil type is Crownthorpe sandy loam topsoil, varying from dark grey to dark brown, formed on pumiceous sandstone, containing beds of stony greywacke conglomerate, with outcrops on the surface in many places. Subsoils are cemented to a hard pan in summer, soften in winter, are fairly fertile, but dry out rapidly. On the flats the sandy loams are heavier and the hard pan makes drainage difficult in winter. Slipping is rare on the hills, and where it does occur regrassing is very slow.

The hill country is dominantly *Danthonia pilosa* with some *Danthonia semiannularis* on the drier faces. Some browntop, fog, ricegrass, and traces of ratstail are present, but not to a significant extent. Scotch thistles in small numbers are also present, but the country is fairly free from weeds. Suckling clover appears in August-September and is finished by November; otherwise the pasture contains no clover.

The flats, which are used for some cropping, grow perennial ryegrass, white clover, and cocksfoot and are topdressed annually with superphosphate at the rate of 1½cwt. per acre.

The whole area is subdivided into 18 paddocks, the largest being 100 acres and the smallest 10 acres (on the flats). No attempt has been made to fence the shady from the sunny faces, as the hills are so erratically formed that this is virtually impossible, but the fencing is such that all paddocks have gullies providing protection from cold winds. There are no shelter belts of trees to provide shade from the sun. Drinking water for stock is provided in all paddocks by springs and reticulation from a stream.

The property winters almost 2 ewes to the acre; it carries 700 to 800 hoggets and about 120 head of cattle. Ewe lambs are kept for replacements and no sheep are bought in. Milk wether lambs are sold fat before Christmas, and those not fat are also sold in the yards before Christmas. In view of the facts that the land is light, that it dries out in summer, that there are practically no clovers in the pastures, and that only a fraction of the area is topdressed, it is apparent that only by good stock management could that be accomplished.

Farming Methods

A system of modified rotational grazing is practised. The ewe flock consists of about 2000 2-, 4-, 6-, and 8-tooth Romney-cross ewes, the 2-tooths being the most numerous and the 8-tooths the least. The flock is approximately as follows:—

Mob No. 1	2-tooths ..	600
Mob No. 2	4-tooths ..	530
Mob No. 3	6-tooths ..	480
Mob No. 4	8-tooths ..	390
		2,000

The pasture illustrated on the left is dominantly *Danthonia pilosa*, which provides grazing all the year round. The conformation of the country in the right-hand illustration is typical of that of the danthonia hills of Hawkes Bay.

A fifth mob consists of mixed-aged ewes which either were dry the preceding season or failed to rear their lambs. Should they fail a second time, they are sold as fats. In addition to the ewes, 700 to 800 ewe hoggets are grazed in two mobs.

Romney rams, in the proportion of 3 to 100 ewes, are turned out with all the older sheep in the mobs on February 12. The 2-tooth ewes are not mated to the rams until 10 days later so that any which lose their lambs may have them replaced from twins among the other mobs. After the rams are turned out ewes are mustered every second day and sometimes held in a small holding paddock.

Three paddocks are provided for each mob from February 12, and every fourth day the mob is moved; the number of days may vary slightly according to the size of the paddock, but a mob is never left in one paddock for more than 5 days or fewer than 3 days. This routine has been carried on for a number of years and has worked well. The sheep muster very easily—one bark from a dog is sufficient to start them moving—and the changes continue until lambing time in July. In the middle of July the mobs are sorted up, ewes closest to lambing being sent to the earliest sunny paddock; as they lamb, they are shedded on to the flat paddocks and more ewes are brought in from the hills to take their places. Eventually all the steeper hills on which the ewes had been running are bare of sheep except for ewes which have no lambs. All ewes with twin lambs are drafted out into one paddock, and from this mob twins are separated and one given to every 2-tooth ewe which has lost her lamb.

Ewe and Wether Lambs Separated

About the middle of August, when all ewes have lambed and the flats and lower hill paddocks are fully stocked, docking is begun. As soon as the lambs have recovered from docking a number are run through the race and drafted into pens with netting sides—the ewe lambs on one side, the wether lambs on the other. The number so drafted never exceeds 120, as this number has been found to be the maximum that can be handled for remothering. The mothers are then allowed to approach the fence, and running each mob of lambs away with their mothers is quite simple. This operation is repeated until the whole mob of ewes and lambs is divided into two—those with ewe lambs and those with wether lambs. To get the wether lambs away fat as early as possible they are placed with their mothers on the best paddocks. Until this practice was adopted very few milk lambs were sold fat off their mothers.

From then on the sheep are set stocked until weaning time—about December 15. The first draft of fat lambs is taken about November 25 and a second draft some 3 weeks later. The balance of the wether lambs almost always are sold in the yards before Christmas.

After being weaned the ewe lambs—the only lambs kept—are drenched for parasites and placed in paddocks which have been saved for them; drenching is repeated in January and February. In February younger ewes are inoculated against black disease. Each ewe is inoculated twice in her life, once as a 2-tooth and once as a 4-tooth.

Culling

In October hoggets are mustered and a percentage culled on wool; the remainder are then shorn and culled for frame, the culls being sold with the cull ewes in January. In this way the hogget mob is reduced by between 150 and 200, only the best being retained for breeding.

Ewes are culled in January. No 5-year-old ewes are kept, and a percentage of 4-tooths are culled on constitution. On this type of country there is always a percentage of young ewes which show a weakness in constitution after rearing a lamb. All cull sheep are sold in January.

The ewe lambs are carried through to the stage when, as 2-tooths, they replace cast ewes. They are given the best paddocks and from June to August are fed pumpkins or kale grown on the flats. Some 700 ewe hoggets are kept through and only the best are fed pumpkins; the weaker ones are turned on to kale in April or May for a few weeks, then on to grass and kale a fortnight at a time until the kale is finished in October. The main mob of hoggets is run on the danthonia hills after the pumpkins are finished.

Cropping is not a very big item on the property, as little suitable land is available, but an endeavour is made always to have some supplementary feed for the poorer hoggets.

Ewes are crutched in February, before the rams are turned out, and again at the end of May. The average lambing percentage is 90.

Cattle

Cattle are carried to keep the pastures in order, and at the same time are quite profitable. A mob of 120 head is always run, 40 weaner steers being bought in each year and the same number of grown steers sold off. From February to June they are usually run in one mob to clean up all rank, dry growth of danthonia, an endeavour being made to have all country clean by June and closely grazed by sheep before the spring growth comes away.

The cattle are kept away from all paddocks containing ewes just before and during lambing, but later they are spread over all paddocks as the feed requires. In exceptional seasons when the usual number of cattle is insufficient to control the growth of grass, additional cattle are brought in to graze. The main growth of danthonia takes place after the first autumn rains and in early November, and danthonia pastures are at their best when grazed closely.

Under suitable management this class of country, though carrying no subterranean clover and not topdressed, mainly because of the topography, may be farmed satisfactorily with a minimum of labour and outlay, but it is essential that the farmer should know his business. The labour to run this property is provided by the farmer and a lad. Only for major works is outside labour employed.

Improvement of Bee Stocks in New Zealand

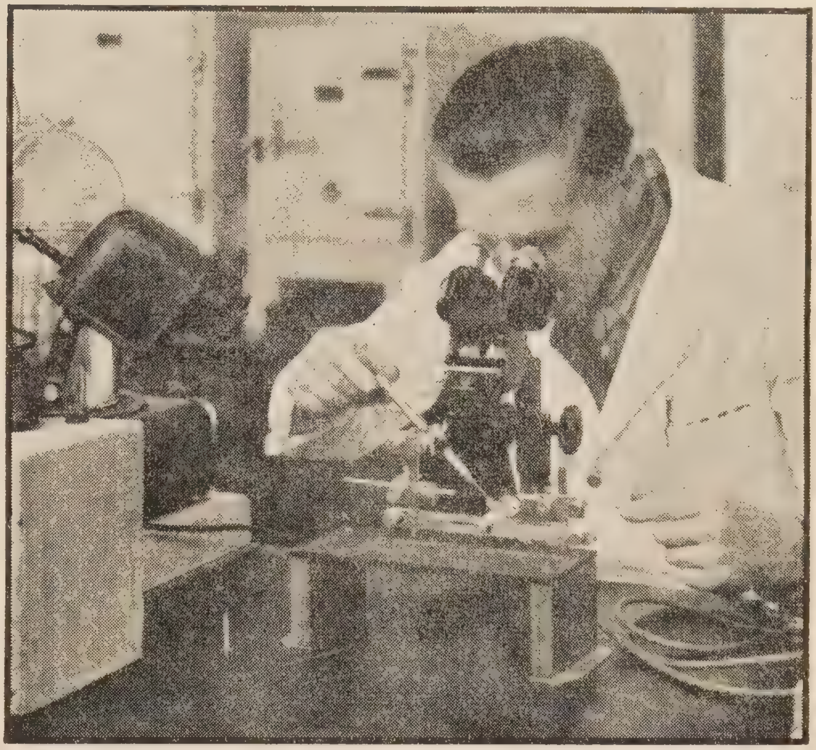
THE business of honey production depends largely on the beekeeper's ability to produce good young queens or to procure them from reliable queen breeders, and to place them safely in the hives at the right time. In this article T. S. Winter, Superintendent of the Beekeeping Industry, Department of Agriculture, Wellington, describes how the Department at its research station at Wallaceville has begun testing the possibilities of instrumental insemination of queen bees to improve bee stocks in New Zealand.

IT has long been recognised that the race of bees most suitable for New Zealand conditions in pastoral areas is the Italian. Not only are the best strains of this race good honey gatherers but they have other desirable traits, including quiet action on the combs when handled by the beekeeper, hive cleanliness, and, generally, a reduced swarming tendency. They are also noted for good temperament, and the queens are easy to find because of their light colour and steady movements. These qualities make the work of the beekeeper more pleasant and speedy, but it is not always possible to develop and maintain the best strains of bees under ordinary beekeeping conditions, due to their mating habits.

Scientific Breeding

It is recognised that others engaged in the livestock industry have benefited more through the application of principles of scientific breeding than have beekeepers because they can practice controlled mating whereas the average beekeeper has no control over individual males and females at mating time. The best he can do is to assemble bees of good type to assist nature to produce desirable strains suitable for commercial beekeeping purposes. Furthermore, not only the average beekeeper but the experienced commercial breeder must be continually on the alert to check results of chance matings to eliminate undesirable strains of bees from their apiaries.

Much valuable time is lost by the beekeeper in selecting and testing the qualities of queens to be used ultimately for breeding purposes, and though some commercial beekeepers whose queen-rearing hives are favourably situated in regard to distance from neighbouring apiaries where less care is taken in regard to quality of stocks, have done excellent work in supplying young queens to the industry where required, there is no certainty of continuity of desirable qualities in succeeding generations of young queens bred under present conditions.



Operator at the Wallaceville laboratory using equipment for the artificial insemination of a queen bee.

Controlled Mating

During the last 20 years research in America has resulted in the development of equipment and technique for artificial insemination of queen bees. Standard equipment for this work was installed at the Animal Research Station, Wallaceville, last year and instrumental insemination of a number of queens successfully accomplished by T. Palmer-Jones, Research Officer. These queens were laying and doing well at the close of last season.

The development and maintenance of good strains of bees best suited to New Zealand conditions would be of great benefit to the beekeeping industry in this country, and now that complete control of breeding is possible the Department of Agriculture has commenced a project to test thoroughly the possibilities of instrumental insemination of queen bees to improve bee stocks in New Zealand.

Supply of Breeder Queens to the Industry

Though it would not be practicable for the Department to supply all the young queens required for use generally in honey-producing hives, it is hoped eventually to be able to supply a limited number of breeder queens of specially developed strains to beekeepers who breed bees for sale to the industry in large numbers each year or for their own use.

The Department will work in close co-operation with beekeepers who have developed good strains of Italian bees as far as possible under uncontrolled conditions and who are willing to supply foundation stocks for this work the first year. An excellent response has been received from beekeepers throughout New Zealand and sufficient breeder queens selected by them from their own stocks have now been received at Wallaceville to enable the work to begin.

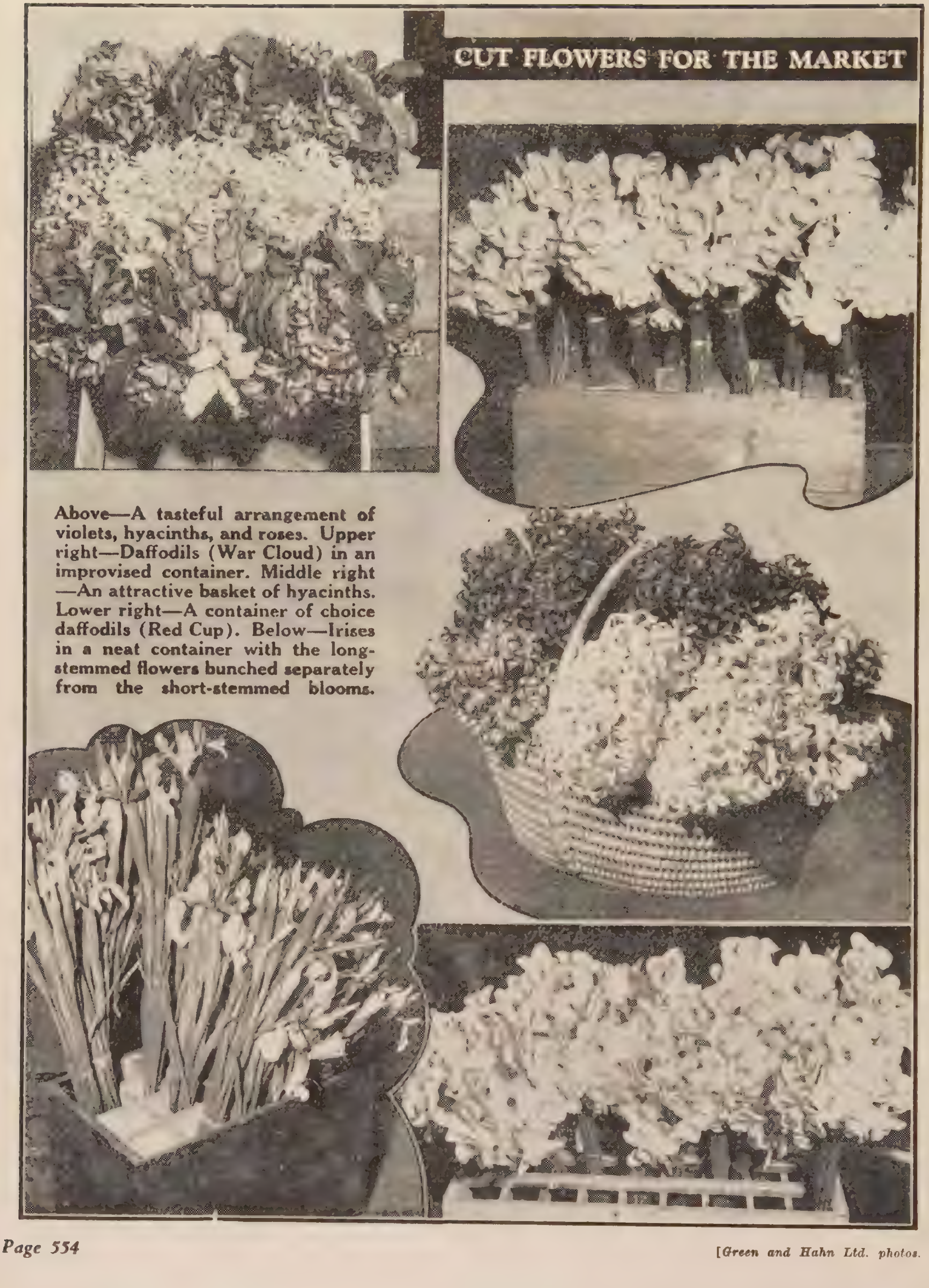
The queens received will be used to raise males and females for selection and controlled mating. Young queens raised in this way will be forwarded in batches, beginning next season, to each beekeeper concerned for testing in honey hives in his own apiary under local conditions, and for a detailed report on their performance. Similar trials will be carried out at Wallaceville.

Selection mating and trials will be continued each season until a satisfactory strain or strains of bees have been obtained. When this objective has been reached breeder queens will be made available to commercial queen breeders each year and to other commercial beekeepers as far as possible as indicated above.

T. Palmer-Jones, Research Officer, is in charge of the work at Wallaceville and Apiary Instructors will co-operate by assisting in the field, where necessary, and by keeping a watch on subsequent trials of young queens under local conditions.

Improvement of bee stocks and of hive management in many apiaries is necessary to improve beekeeping economy in New Zealand.

CUT FLOWERS FOR THE MARKET



Above—A tasteful arrangement of violets, hyacinths, and roses. Upper right—Daffodils (War Cloud) in an improvised container. Middle right—An attractive basket of hyacinths. Lower right—A container of choice daffodils (Red Cup). Below—Irises in a neat container with the long-stemmed flowers bunched separately from the short-stemmed blooms.

[Green and Hahn Ltd. photos.

Harvesting and Marketing Cut Flowers

THE cut-flower industry has been well established for many years in other countries, but only within recent years has it come into its own in New Zealand. Methods which have come to be accepted in the industry are described and advice offered to intending growers in this article by C. G. Aldridge, Horticultural Inspector, Department of Agriculture, Christchurch.

FOR certain phases of floral work—the making of wreaths, posies, and bouquets and the supply to hospitals, hotels, and shipping—the demand has varied little in New Zealand. Only a small percentage of the public buys these lines, and the future holds some promise for the industry if good-quality lines can be provided at prices which are an inducement to every housewife to have floral decorations in the home.

To do this the grower must use production methods which keep costs at a minimum, and the blooms must arrive at the markets fresh and attractive, which is probably the most important phase of flower production. A grower may be diligent, his gardens well cultivated, and his blooms perfect, but unless they arrive at the market still retaining their freshness they will bring only a second-grade price.

Many successful growers have developed an artistic sense which enables them to know just when and how to pick their blooms, how to handle them, and how to appreciate them. This brings its own rewards apart from remuneration.

Harvesting

The best time for cutting flowers is generally recognised as early morning or late afternoon. However, gladioli can be cut even in the heat of the day with no detrimental results if they are placed in deep receptacles of cool water in a shady place.

Careful handling is essential to the harvesting of cut flowers. Rather than reach over the beds, with the possibility of damaging plants, harvesters should work beds from both sides.

Flowers should always be cut with stems as long as possible. For this reason, and also to prevent the sap from becoming a nuisance, narcissi are pulled instead of being cut and the stems are trimmed after they have been bunched.

With the exception of the everlastings, most flowers should be cut either in the bud or when the bud is about to open. Roses, poppies, liliums, iris, and tulips are among those which should be cut in the bud; hyacinths, gladioli, narcissi, and stocks are among those which should be cut when the lower florets have opened. Cutting at these stages reduces damage during transport and ensures that the florist receives blooms having the longest possible life.

Grading

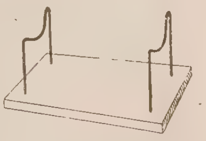
Some growers first pick all the top-grade blooms and then go over the beds again taking all the second-grade ones. This method is used mostly where labour is employed in the packing shed, but a grower who works on his own usually picks all suitable blooms at the one time and grades them in the packing shed as the flowers are being bunched. Floral buyers very quickly come to know whether a grower is consistent in his grading. Buyers often visit markets before the auction begins and ask for lines of a certain grower—obviously because they know his lines.

Some men have been most successful growers in times of depression and in times of plenty, and the secret of their success is that they have become known for consistency in the quality of their lines. That does not mean that all their lines were of highest quality, but inferior blooms were never found squeezed in among their first grades to make up the number. Their second-grade blooms were up to a certain standard, and all below that standard never found their way to the market.

If the season is such that few flowers are of a high standard, a grower should not be tempted to mix inferior blooms with "specials" or short-stemmed flowers with the long-stemmed ones. They should be kept separate, for if a buyer notices one inferior bloom in a bunch, the quality of that bloom will determine the quality of his bid.

Bunching

Some growers advocate the use of a bunching cradle to facilitate the handling of the flowers. This cradle is simply made from a piece of wood 18in. x 6in. x 1in. and a length of No. 8 fencing wire. The required number of flowers is placed on the



Heading photograph by Green and Hahn Ltd.

AT LAST . . .

DRY DRENCHING with "PHENOVIS"

5 Gramme PHENOTHIAZINE PELLETS

"Phenovis" 5 gramme pellets bring a host of advantages to the sheep farmer. They permit no staining during drenching . . . they are easy to handle and administer. "Phenovis" also eliminates guesswork, as each pellet contains an accurate dose of Phenothiazine.

Full particulars of "Phenovis" dry drenching will be supplied free of charge on application to:

N.Z. DISTRIBUTORS:

SUMMIT
PRODUCTS LTD.
P.O. Box 328, Palmerston North.

TOMOANA STOCK LICK

is the cheapest — and it's good!

Here's real Tomoana quality and Tomoana value — a fully phosphatised, cobaltised and iodised lick which complies fully with the highest standards, at a price which cannot be beaten. Order a hundred-weight trial bag from your Produce Merchant or Dairy Company *today*.

W. & R. Fletcher (N.Z.) Ltd., Wellington.

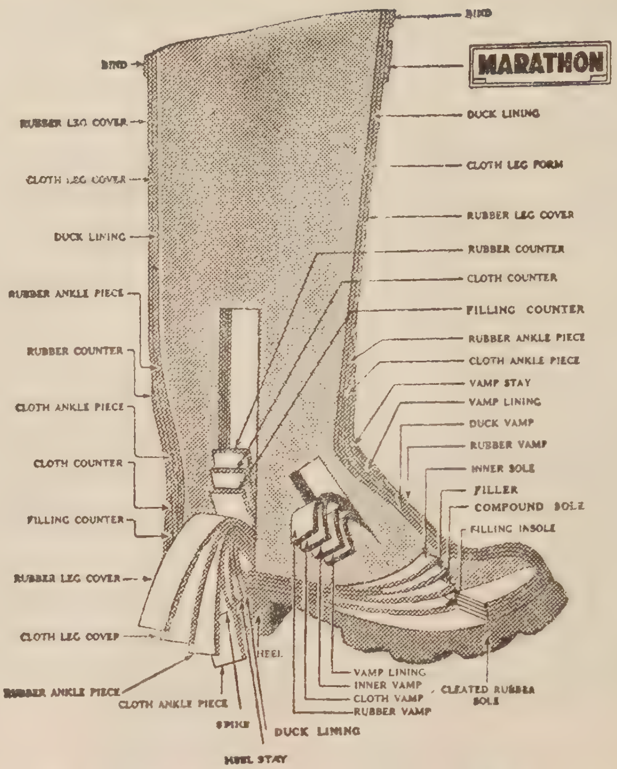
"VIVID" MARKING RADDLE

(Approved under Stock Act, 1908)
TESTED FOR EXPOSURE AND SCOURABILITY

6 — Bright Colours — 6

Boxes containing full set posted anywhere in New Zealand for 10/-, chargeable through your usual supplier.

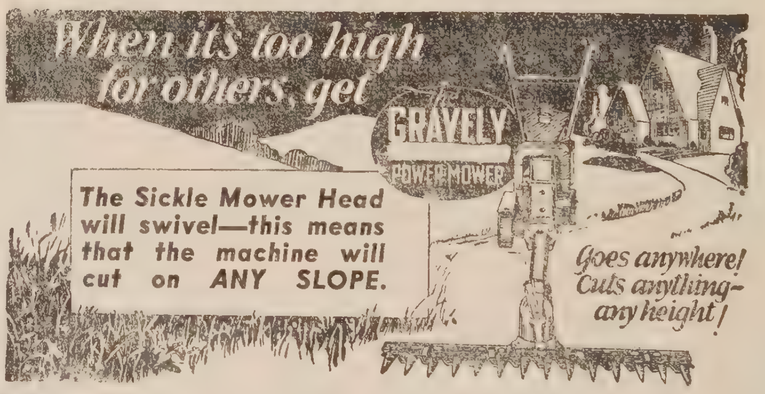
Write to—
BLACK & GOLD PRODUCTS
Hawera :: Taranaki


BIND
MARATHON
BIND
DUCK LINING
RUBBER LEG COVER
CLOTH LEG FORM
CLOTH LEG COVER
RUBBER LEG COVER
DUCK LINING
RUBBER COUNTER
CLOTH COUNTER
RUBBER ANKLE PIECE
FILLING COUNTER
RUBBER ANKLE PIECE
RUBBER COUNTER
CLOTH ANKLE PIECE
VAMP STAY
CLOTH ANKLE PIECE
VAMP LINING
DUCK VAMP
RUBBER VAMP
CLOTH COUNTER
INNER SOLE
FILLER
COMPOUND SOLE
FILLING COUNTER
FILLING INSOLE
RUBBER LEG COVER
CLOTH LEG COVER
HEEL
VAMP LINING
INNER VAMP
CLEATED RUBBER SOLE
CLOTH VAMP
RUBBER ANKLE PIECE
CLOTH ANKLE PIECE
RUBBER VAMP
SPIKE
DUCK LINING
HEEL STAY

"MARATHON" GUMBOOTS

The GRAVELY

Combined — POWER MOWER
and — GARDEN TRACTOR


When it's too high for others, get
GRAVELY
POWER MOWER
Goes anywhere! Cuts anything-any height!

The Sickle Mower Head will swivel—this means that the machine will cut on ANY SLOPE.

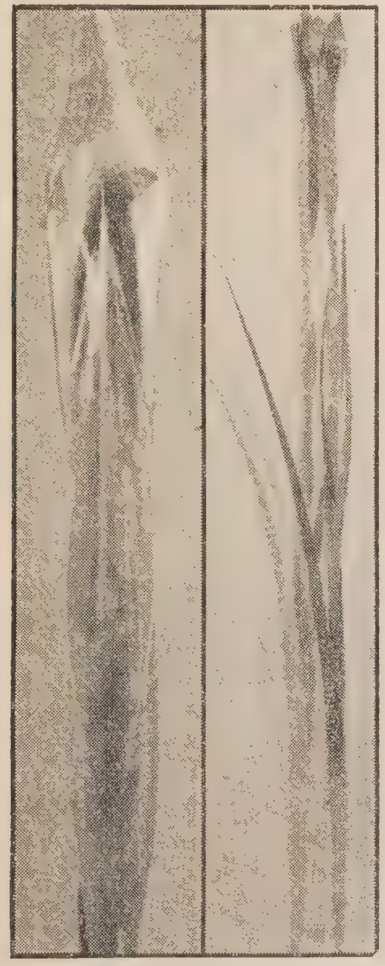
- 2½ H.P. ENGINE
- 42in. SICKLE BAR
- Garden Attachments Available

For details, write to—
IVORY BROS. LTD.
Box 1321 :: Wellington.

cradle and tied. Use of the cradle probably facilitates tying, but whether it is quicker than bunching by hand and using rubber bands is doubtful.

Methods of tying differ between growers. Some prefer to use raffia, some a soft twine, and others rubber bands. Objections to rubber bands are that if they are too tight, the stems are bruised and very often break, and if they are slack, the bunch frequently falls apart. However, with a little practice choosing the correct-sized bands becomes easy. Undoubtedly their use makes bunching easier and quicker than tying, and the bunch is neater.

Flowers should not be jumbled together in bunches haphazardly, but should be arranged so that the florets are not crushed. With one stem held upright in the left hand, additional blooms are placed in such a manner that they face outward. When this circle is completed the remainder are worked into the bunch either above or below until the required number is bunched. The rubber bands are then applied and the stems trimmed neatly.



[*Green and Hahn Ltd. photos.*

Left—An iris bud at the correct stage for picking. Right—A good, long-stemmed iris spike. The bud is beginning to unfold, and picking should not be delayed beyond this stage.

After bunching Iceland poppies it is customary either to singe the ends of the stems or to dip them into boiling water, which improves their keeping quality.

Though no standards are fixed, auctioneers like to have uniformity in the number of blooms in a bunch. The following table is a fairly-general guide:

	Number in bunch		Number in bunch
Anemone ..	12	Ranunculuses	12
Carnations ..	6	Roses ..	12
Calla lilies ..	6	Stocks ..	12
Freesias ..	12	Narcissus Soleil d'Or	12
Gladioli ..	3 or 6	Trumpet daffodils	*6 or 12
Hyacinth ..	3 or 6	Violets ..	25
Iris	*6 or 12		
Lilium ..	3 or 6		
Poppies ..	12		

* According to price.

When some lines are early and will bring exceptionally-high prices, it is customary to reduce the number of blooms in a bunch; as the season progresses and prices drop, the usual number is reverted to.

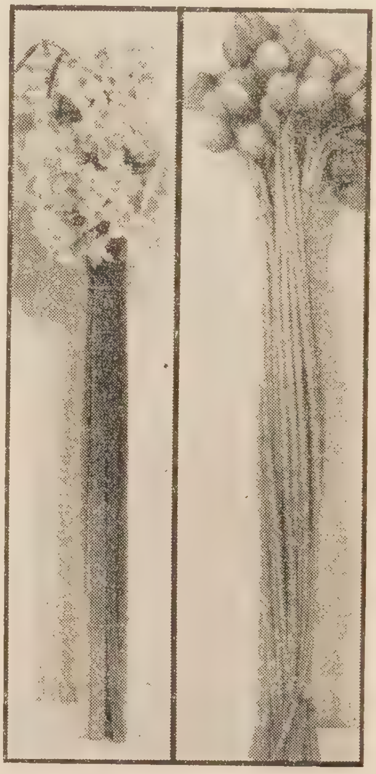
Foliage is arranged with cut flowers only in the case of violets, bunches of which sometimes are surrounded by the leaves, thus making posies. After being bunched the flowers are placed in deep receptacles of cool water and usually left to stand overnight; this is important, as it restores freshness to the blooms and when taken to the markets in the early morning they present a natural, fresh appearance.

Packing

To a grower who is close to a good market packing presents no difficulties, as the flowers can be packed firmly but not tightly in a container and placed in the market without danger to the blooms. For trumpet daffodils, gladiolus, iris, liliums, calla lilies, and other tall plants, inexpensive travelling boxes are easily constructed; they are returnable to the grower. Some growers who take a pride in their products have made neat, varnished containers which, when filled with choice blooms, look very attractive and contribute toward a satisfactory price being obtained.

Strong, light containers are used for cut flowers to be sent to a distant market, alternate bunches being laid in them in opposite directions. Care must be taken that no moisture is on the flowers or they will sweat and deteriorate rapidly. Cardboard boxes having close-fitting lids are unsuitable, as aeration is prevented, thus allowing the accumulation of carbon dioxide and causing the blooms to have a short life. The same effect is produced by wrapping cut flowers in waxed paper and placing them in air-tight boxes.

Too often good blooms arrive in the flower market in a dirty case lined with newspaper. Everywhere today commodities are displayed in attractive containers, yet many growers cannot realise that the small additional expense of providing good cases lined with clean paper is warranted. It may be argued that the case is used only to convey the flowers to the market, where they are removed from the case and held up for sale, but the little extra cost and labour involved are well repaid by the establishment of a good name, resulting in increased returns.



[*Green and Hahn Ltd. photos.*

Neat, long-stemmed bunches of narcissus Soleil d'Or and Iceland poppies.

Marketing

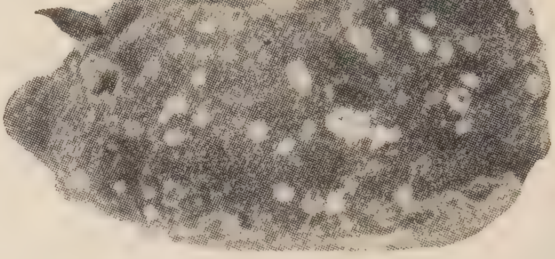
Most auctioneers are pleased to be helpful and an intending grower is well advised to seek the advice and help of a flower salesman, for no one understands the selling end of the business as he does. He can be told what the grower intends to produce and asked whether these lines are in demand. When the grower contemplates sending in a consignment he should tell the auctioneer what quantities are available and how many may be expected each week. An endeavour should be made to carry out commitments and thus build up confidence between grower and auctioneer.

A visit to the markets to see in what condition his produce arrives, see it marketed, and compare it with other lines repays the grower. If he feels that his produce did not bring the price expected, he can talk it over with the auctioneer, which is far better than dodging from one market to another trying to "catch the price."

Some growers send their choice lines to one market and their inferior plants to another, but whether this method brings any material gain is doubtful, as in one place they establish a name for quality and in the other a name for a poor product. Establishing a name for quality lines and honest dealing spells success.

Poultry Diseases Caused by Mould and Yeast Infections

DURING the past two seasons several heavy mortalities in chicks have occurred which could be traced to the use of mouldy litter in hatcheries—losses which could have been avoided had only first-quality, clean material been used. As another chick-hatching season has passed, this article by R. M. Salisbury, Veterinary Research Officer, Department of Agriculture Animal Research Station, Wallaceville, draws the attention of poultry farmers to the dangers of the use of mouldy litter in chick boxes or brooder houses and the feeding of mouldy and fermented foodstuffs.


[*Photo from the "Jen-Sal Journal," U.S.A.*
Portion of the lung of a bird afflicted with brooder pneumonia, showing the white nodules which are one of two types of lesions occurring in this disease.

SUCH conditions may give rise to two diseases, referred to in the laboratory as aspergillosis and moniliasis. The first is caused by a mould known as *Aspergillus fumigatus* and is commonly called brooder pneumonia; the other condition is caused by a yeast called *Monilia albicans*.

Brooder Pneumonia

Aspergillosis usually occurs in one of two main forms—acute outbreaks in young chicks, affecting a large number and causing a high death-rate in the brooder, or as the cause of occasional deaths in adult birds, the rest of the flock remaining healthy. The first type is the main cause of concern.

As the name "brooder pneumonia" implies, the symptoms affect mainly the lungs. Diseased chicks stand around with drooped wings and mouths open, gasping for breath. Post-mortem examination shows abnormalities only in the lungs, which are markedly congested and show small yellowish nodules which to the untrained eye may resemble the abscesses occurring in pullorum disease. The disease closely resembles pullorum disease in several respects, particularly the age incidence and symptoms. It cannot be differentiated with accuracy without laboratory examination, when in the case of pullorum disease the causative bacteria *Salmonella pullorum* is isolated, and in the case of aspergillosis the mould can be grown in 48 hours, showing up as a greenish growth on a special growth medium.

Aspergillosis may also take another form in which the eyes are affected, showing a marked wateriness, with a tendency for the eyelids to be gummed together. On occasions a yellowish, cheesy material under the eyelids is also present.

The age at which chicks become affected varies from 4 days up to 4 weeks, or for the duration of the brooding period.

No drug is known to be effective against the mould concerned. The only recommendation which can be given for preventing the disease is to ensure that only mould-free litter is used in chick boxes and brooder houses. In the event of a positive diagnosis being given, the litter should be replaced, at least ensuring that more cases will not occur. If dry mash is fed, the mash should be damped slightly to reduce dust to a minimum.

In one outbreak last season the mould was isolated from the chick-box litter, and tests at regular intervals showed that it was still infected 5 months afterward; this indicates how long contaminated litter can remain a source of infection.

The disease is of little consequence among adult stock, though mortality in racing pigeons as a result of *Aspergillus* infection has been recorded.

Moniliasis

Though it was diagnosed for the first time in New Zealand only last year, many confirmed cases of moniliasis are now on record. In the absence of full case histories, the importance of the disease to the poultry industry in New Zealand cannot be assessed. However, enough is known to indicate that it is the cause of some of the sporadic deaths which occur, and the fact that it has been diagnosed in conjunction with coccidiosis would indicate that it may at least reduce the resistance of birds to some extent and allow other diseases to obtain the upper hand.

Overseas experience shows that moniliasis alone can be the cause of serious mortalities, and as it is known to be present in New Zealand it must be regarded as a potential danger.

The disease affects young birds, particularly those between 2 and 6 months old, though occasionally younger and older birds are attacked. It is primarily a disease of the digestive tract, and the main sites of infection are the crop and fore-stomach (proventriculus), though the whole of the intestines may be affected. An affected chick shows unsatisfactory growth, a stunted appearance, listlessness, and roughness of the feathers. Birds which have died suddenly have been visibly affected for only 24 to 36 hours, when leg weakness was observed and death followed, accompanied by convulsions. Post-mortem examination shows that the crop is usually empty and the lining membrane is raised in ridges and shows small ulcerations; it is commonly referred to as having a "Turkish towel" appearance. The fore-stomach is often much thickened and ulcerated, and where the intestines are involved the mucous membrane shows small ulcers through practically its whole length. The causative yeast can be grown readily on special media, but a positive diagnosis can be given only after post-mortem examination.

Fortunately, the disease can be controlled readily and cheaply by substituting a dilute solution of copper sulphate (bluestone) for the drinking water for 3 days. Such a solution can be made by dissolving 1oz. of bluestone in 12½ gallons of water (1 level teaspoonful to 2 gallons).

To trace the source of contamination is not so easy, but as the presence of yeasts is related to generally unhygienic and insanitary conditions, corrective measures in this direction should be undertaken. Food containers should be cleaned regularly, particularly where wet mash is fed.

Free Diagnostic Service

If chick losses are experienced, all dead chicks should be sent to the Chief Diagnostic Officer, Animal Research Station, Wallaceville, for determination of the cause of death. The birds should be accompanied by a letter outlining the history of the affected birds. A number of chicks—between 3 and 6—is necessary for assessment of the most likely cause of mortality. Single birds can give no significant finding and may give a completely misleading picture. The diagnostic service is free, but the reporting of results of any treatment recommended is appreciated, as only by the accumulation of such data can the effectiveness of control measures recommended be determined.

Aspergillosis and moniliasis are not the only two known mould and yeast infections of poultry. Favus or white comb is another, but for practical purposes it is not of economic importance.

PRE-LAMBING SHEARING OF EWES

By G. R. MACKINTOSH, Inspector of Stock,
Department of Agriculture, Hamilton.

IF, during the early 1930's, the practicability and usefulness of shearing ewes a short time before lambing had been suggested, there would have been few who would not have ridiculed the idea without so much as considering it. To have deprived a sheep at a time when it was heavy in lamb of the protective covering of wool with which Nature had provided it, and during the coldest and usually the wettest time of the year—late winter or early spring—would have appeared so obviously contrary to common-sense farming as to have been almost absurd.

THE practice has been successfully undertaken, however, by so many farmers, and, strangely enough, mainly those in the colder parts of New Zealand such as Southland, Otago, and Canterbury, for so many years, that, whether it is a worthwhile and safe practice or not, it is an aspect of farming which warrants the attention of all progressive sheep men.

As pre-lambing shearing has in the past decade continued to increase in popularity in the South Island, where temperatures generally are lower than in the North Island, it is surprising that the practice is not more widely known to farmers in the warmer and sheltered parts of the easier country of the North Island.

Therefore, to acquaint farmers not only of the advantages and disadvantages claimed, but particularly of the methods and precautions to be adopted in undertaking pre-lambing shearing, the experience and opinions of a well-known Waikato farmer, Mr. H. P. Hewitt, who farms 1000 acres on the Te Miro hills, near Cambridge, are recorded.

When Mr. Hewitt first sheared his ewes about 3 weeks before the date on which lambing was due, a sudden and severe hailstorm occurred immediately after one batch of ewes was turned out. However, none of the shorn ewes was lost. This experience, although it caused great anxiety at the time, gave him much more confidence to repeat the procedure during subsequent years, and the advantages were considered to be so decidedly worthwhile that it has since become a regular practice with him. Incidentally, although the clip on that occasion was of only 9 months' duration instead of the usual 12 months, the wool was of light condition and so free of any break that it realised 3d. per lb. more than that sold by neighbours.

Farmers who would consider shearing before lambing and who have adequate shearing-shed and suitable paddocking facilities are recommended to prepare for shearing operations by shutting up some good-pastured and, if possible, sheltered paddocks. In doing so it is wise to avoid those containing trees under which sheep would be exposed to cold draughts should a storm occur. The farmer cannot be sure of having the necessary amount of feed every year, but by shutting up a good paddock he can be sure that the ewes "just off the shears" obtain ample feed immediately. This essential of pre-lambing shearing is most important. Extra care must be taken in mustering, yarding, and particularly in handling the ewes at shearing, as obviously if this is done the shock of shearing is not aggravated. It is preferable to muster the sheep in small mobs and endeavour to complete shearing before 4 p.m. each day to enable the sheep to get a full feed before nightfall. Do not keep the sheep about the yards unnecessarily.

Advantages of Practice

The advantages claimed for pre-lambing shearing are:—

1. There is a greater natural exercise of ewes, which thus lessens bearing trouble, tends toward a continuity of feeding during the days of late pregnancy and so greatly reduces the incidence of sleepy sickness, and permits an easier lambing by the ewe.
2. It is contended that shorn ewes are quicker to take advantage of the shelter of gullies, hedges, etc., and will tend to lamb in a more sheltered place than would unshorn sheep.

[*Fraser Niederer photo.*

In-lamb ewes just after shearing.

3. Shorn ewes do not get cast.
4. The lamb finds it much easier to get its first drink.
5. For the foregoing reasons there tends to be a better lambing percentage.
6. Easier mustering for docking and more ready identification of late and dry ewes.
7. Practically no attention is required after docking, which thus leaves labour available for spring work.
8. The ewe will feed easier in late spring and will maintain its milk supply without the interruption of shearing and associated mismothering, etc. The lactation period of the ewe will also last longer.
9. The lamb gets an uninterrupted milk supply through the critical stages of its growth, thus avoiding the check at shearing which retards its progress.
10. As lambing is such a disturbance to the ewe, no matter what care is given to the flock a wool break will occur in many a fleece. Therefore such wool damage is avoided by shearing before lambing.
11. To a great extent pre-lambing shearing eliminates the need for crutching.
12. The body of the ewe requires the heat and energy of its fats during the winter and early pregnancy, and consequently less "condition" is found in the early-shorn wool. It is cleaner and brighter and consequently commands a higher price.
13. Shearers and shed hands are generally more freely available before the main shearing period. Similarly, shearing before lambing also helps to alleviate the rush period at the wool stores, as the clip would be handled before the bulk supply came in.

Not the least of the advantages is the saving in labour, as will readily be realised by practical sheep men. For instance, it is obviously much easier to muster ewes before than after lambing.

Farmers who have undertaken this practice have proved without a doubt that ewe losses at lambing time have decreased by 3 to 4 per cent.

Disadvantages of Practice

The disadvantages of shearing before lambing are:—

1. The weather over a period of years may not be as good during the pre-lambing period as the average weather experienced in October, November, or December.
2. The actual shearing may not be quite as easy, as with the colder weather the wool has not begun to "lift."
3. Many fleeces do not roll as compactly or easily as when shearing is done in warmer weather, and if they are not handled carefully, there is a probability of a greater number of broken fleeces.
4. Where the type of farming entails the buying in of 5-year-old ewes each year, as is common with fat-lamb farmers, the prospect of obtaining only 6 to 9 months' wool instead of a full year's clip would not appeal.
5. The farmer with inefficient dogs may find it more difficult to catch a shorn ewe at lambing time than if it has a good fleece.

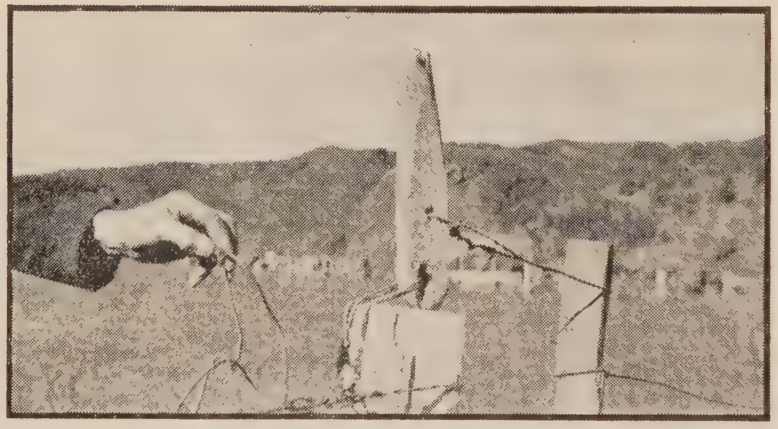
In the sale of wool farmers who shear early stand to gain on a falling market, but on a rising market a lower return is probable.

Interested Waikato sheep men whose opinions were sought by the writer substantially agreed with the advantages and disadvantages stated.

Farmers who are inclined to adopt pre-lambing shearing are urged to give careful consideration to what it entails and satisfy themselves that they have the facilities, shelter, and feed available.

If such a large and increasing number of farmers in the colder south are adopting and persisting in the policy of shearing their ewes some weeks before they are due to lamb, it would seem that there are possibilities of increasing the efficiency of sheep farming on the easier country of the North Island where established farmers have the facilities to approach this practice carefully. To a great extent it is by the dissemination of information gathered from farmers who have developed new ideas and proved them successful that other farmers can copy their techniques and so increase their own efficiency. There is no doubt that farmers who have been willing to learn from others in the past have improved their methods greatly. The high standard of New Zealand's farming is substantially due to this, and as each farming unit becomes more efficient so the whole of the economy of New Zealand benefits.

Vertical Lever-fastener for Taranaki Gate



TO give the necessary tension to the wires of the gate, a Taranaki (wire-and-batten) gate is best fastened with a lever. The common form of lever-fastener is one which is horizontal in action at the side of the strainer. The illustration, which was obtained on the farm of Messrs. Kelson Bros., Waimana, shows an improvement on this type of fastener. Here, the lever is situated on top of the strainer and is vertical in action. The pull is therefore more direct than is the pull of the side lever and, in addition, this top lever is much more easily handled from either side of the gate.

To complete the fastening of the gate from the position shown in the illustration the lever is depressed and the end of it is engaged in the wire loop permanently attached to the top wire of the fence.

—*E. R. MARRYATT, Fields Instructor,*
Department of Agriculture, Whakatane.

Vaccination Against Contagious Abortion

APPLICATIONS by farmers for vaccination of their calves against contagious abortion in 1950 are now due. The charge is 1s. 6d. per calf for the first 14 calves in any herd and 1s. 3d. per calf thereafter. The closing date for applications is January 13 and a late fee of 10s. is payable on all applications received after this date.

As in previous years members of veterinary clubs should apply to the secretary of their club and other farmers should apply to their nearest Inspector of Stock, from whom they can obtain the necessary application forms. Applications to Inspectors of Stock must be accompanied by a cash payment calculated on the basis of the charges mentioned above.

It is desirable that applications be sent in as early as possible so that vaccinating officers can arrange the work efficiently. Farmers are therefore requested to forward their applications by December 31.

Establishment of Paspalum: Lupin Varieties

SEASONAL NOTES Contributed by the EXTENSION DIVISION

ON moist soils in the warm northern districts of New Zealand paspalum is a valuable producer of summer and autumn feed. If paspalum is combined with perennial ryegrass and white clover and the sward maintained in that condition by controlled grazing and adequate manuring, the grass can make a valuable contribution to summer dairy production without loss of production in winter and spring when paspalum is dormant. On the other hand, pure swards of paspalum have a very low winter and spring production and, except on the very richest land, soon become sod bound if neither white or subterranean clovers nor *Lotus major* is an important constituent of the pasture.

Except on the very richest swamp land, paspalum pastures soon become sod bound and unproductive unless the grass is associated with clover. The maintenance of a paspalum-ryegrass-white clover sward requires regulated stocking to control the heavy summer and autumn growth, and the application of fertilisers (and lime when necessary) to maintain white clover in association with the grasses.

PASPALUM belongs to a group of plants most of which are natives of tropical or semi-tropical climates. Therefore it will thrive only in a district having a warm summer and a fairly high annual rainfall. Nor will it stand severe winter frosts, so its use is confined largely to the warmer areas of Auckland, Poverty Bay, Hawkes Bay, and Taranaki Provinces.

Though paspalum is a most vigorous summer and autumn producer when properly managed, it is not an easy species to get established in the normal autumn-sown pasture mixture. The seed varies considerably in germination, much of it being very poor, particularly New Zealand-saved seed, and consequently farmers are advised to sow the better-germinating Australian seed. In all cases they should insist on being supplied with seed of a satisfactory standard of germination.

Slowness of Germination

Paspalum seed is rather slow to germinate, and the young seedlings require warm soil conditions if they are to come away quickly. They are very susceptible to frost injury and are easily smothered by more rapidly-growing species in the mixture.

Because of these factors, many farmers have had disappointing results from paspalum sown in autumn, frequently having to wait several years before much of this grass is seen. Experiments at Warkworth, Northland, in which paspalum was autumn sown in a mixture containing ryegrass seed showed little or no paspalum until the second spring afterward. In this trial it was evident that the establishment of the paspalum was greatly affected by the quantity of ryegrass seed sown—the greater the quantity of ryegrass, the poorer was the establishment of paspalum. This experimental evidence was confirmed in a similar trial at Taumarunui.

At first glance the obvious solution would appear to be to sow down the pasture mixture in spring rather than in autumn, but certain factors limit the success of this practice. In most districts spring sowing is done in September or early October, when annual weeds are starting to appear. In districts subject to heavy annual weed infestation the success of a spring-sown pasture is jeopardised by weeds, the growth of which frequently is so heavy as to smother out many of the pasture species. Again, if ryegrass is included in the mixture in any quantity, it will create the same smothering effect as it does when sown in autumn.

Trials with New Methods

Of recent years several new methods of establishing paspalum have been tried with very encouraging results. These are all based on the knowledge that paspalum seed requires a warm, moist seed-bed for satisfactory germination and that the seedlings cannot stand heavy competition from associated species.

The first of these methods is to sow paspalum seed pure in November or early December, following it with the balance of the pasture-seed mixture in the next autumn as an oversowing. Paspalum is sown on a well-worked seed-bed at the rate of 6 to 8lb. per acre. The seedlings have excellent conditions for germination and ample room to develop. This method has given good results in several cases, but an improvement would be the inclusion of 3 to 4lb. of red clover seed with the paspalum seed. The clover gives some protection to the young paspalum as well as providing nitrogen for the seedlings. On soils especially suited to red clover excellent grazing can be obtained from the area in late summer and early autumn, and conditions are ideal for surface working the ground in late February or early March before the balance of the seed mixture is sown.

Another method tried with success is to sow paspalum and red clover with seed for a swede crop. By the time the swedes are properly in leaf the paspalum is well established and with the red clover provides a valuable supplement to the swedes in the following winter. After the swedes have been fed off the paddock is grazed in the normal farm grazing programme and provides good feed in the following late summer and early autumn, after which it is renovated with the balance of the pasture mixture.

Excellent results have also followed the sowing of paspalum with soft turnips or rape. If the seed is sown early, or if the resultant crop is to be fed off before March, the balance of the grass and clover species may be autumn sown.

On an established farm on which paspalum is already present in some of the paddocks this grass will soon show up over the whole area and its establishment and spread offer little difficulty, but on the farm where there is little or no paspalum the methods of establishing this grass described can be of value. In cases where they have been tried farmers have found that strong, healthy paspalum is present within 3 months of the seed being sown.

The introduction of paspalum into an all-grass farm which contains none of this species, and on which no ploughing is to be done, presents another problem. Attempts to oversow pastures with paspalum have not been very satisfactory because of the slow germination and rate of establishment of the paspalum seed. Many farmers have had fairly good results from feeding out paspalum hay, but obtaining a good-quality hay containing a reasonable quantity of viable seed is the difficulty.

LUPINS are a valuable fodder crop, especially on light and medium soils where prospects of obtaining a good turnip crop are uncertain. They are a safe crop under average farm management and provide a fair amount of feed of high nutritive value. They can be fed to stock at any stage of growth, but usually are left until near flowering. At this stage they provide the maximum of leafage with a minimum of coarse stem. Until then they are resistant to heavy frosts, but once the buds begin to show colour this frost resistance disappears and plants are likely to be damaged by lighter frosts than they may have withstood already. Though lupins sometimes suffer from attacks of "sore shin" and sclerotinia disease, the damage is seldom extensive. They appear to be highly resistant to insect attack, a characteristic that makes them all the more valuable in areas where turnip crops are uncertain. They are also excellent for introducing nitrogen into the soil and are valuable as green manure.

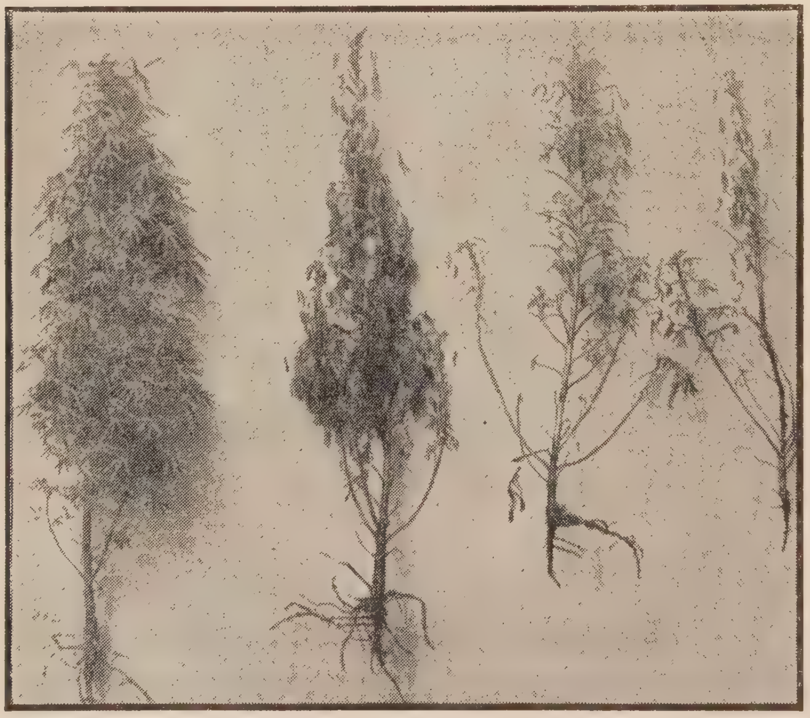
Sheep grazing on blue lupins, which are a valuable fodder crop.

At present two varieties, Bitter Blue and Sweet Blue, are in general cultivation and fill a valuable place in the farm economy where they are being grown. A Sweet Yellow variety has also been tried.

Bitter Blue is the variety introduced to Canterbury more than 20 years ago. It is a strong-growing plant and provides a fair amount of nutritious feed. It has taken the place of turnip crops in districts where turnips cannot be relied on. Bitter Blue lupins are not grown as a fattening crop, but rather as a crop that will provide a succulent bite when other feed is short. Though occasionally used for feed in spring, they are more popular for grazing in autumn and early winter. They are extremely bitter and sheep need to be introduced to them gradually. Ewes soon acquire a taste for the plants despite their bitterness. Once acquired, this taste does not appear ever to be forgotten, and sheep will then eat them readily at all times.

Sweet Blue variety is very similar to the Bitter Blue in appearance, but it has a low alkaloid content and lacks the bitterness. Sweet Blue lupins can be used for autumn and winter feed, but their chief advantage is their palatability and therefore their usefulness for lamb fattening. They appear to be more delicate than the bitter variety and require a slightly-better soil and a higher rainfall to produce the maximum results. Their palatability brings the disadvantage that hares will travel long distances to eat them in the young, succulent stage and have been known to clean up small areas completely. They are well worth a trial in areas where rape is likely to be damaged severely by diamond-backed moths, white butterfly, or club root.

Sweet Yellow lupins for good results appear to need warmer temperatures and are more suitable for North Island conditions than the blue varieties. Trials in the north have compared Sweet Yellow lupins with both Sweet Blue lupins and rape for lamb fattening. Results have been encouraging, particularly on the sand country of the Manawatu district, but scarcity of seed supplies has prevented a wider use of this variety. The seed shatters from the pod very easily, so that much is lost during harvest, and seed yields have been very discouraging. This variety has been grown in Canterbury, but has not proved very successful. Trials are now in progress with a non-shattering type of Sweet Yellow lupin which, if successful, probably will solve the seed-supply problem.

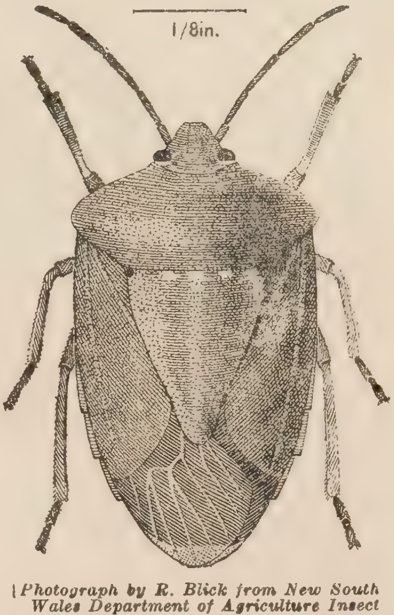


Lupins sometimes suffer from attacks of "sore shin," but the damage is seldom extensive. The healthy plant on the left is contrasted with others showing the disease at different stages.

The Green Vegetable Bug *Nezara viridula*

By R. A. CUMBER, Entomologist, Entomological Research Station,
Department of Scientific and Industrial Research, Nelson.

THE green vegetable bug *Nezara viridula* L., a cosmopolitan insect, was first recorded as a pest in New Zealand in April, 1944, when specimens found attacking beans in the New Plymouth area were submitted by the Fruit Inspector of the Department of Agriculture. It had been reported as occurring in New Zealand by Kirkaldy in 1909, but in that instance the bug was confused with the native pentatomid *Glaucias amyoti* Wh., which may easily be mistaken for *Nezara*. If the original record of *Nezara* had been correct, it certainly would have manifested itself as a serious pest before 1944. *Nezara* probably reached New Zealand in 1941.

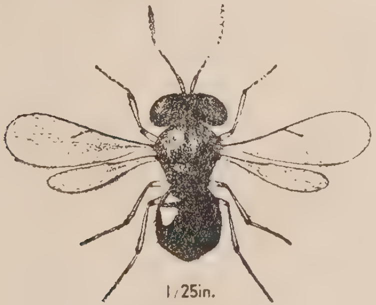


[*Photograph by R. Blick from New South Wales Department of Agriculture Insect Pest Leaflet No. 5.*
An adult of *Nezara viridula.*

IN 1946 *Nezara* was reported from mid-Northland, and now most areas north of Whangarei are affected to some degree by its depredations. It is found in the northernmost isolated settlements such as Te Hapua, indicating its powers of dispersal across what would appear to be unfavourable areas. Recent reports indicate moderate infestations in the Te Kaha area, Bay of Plenty.

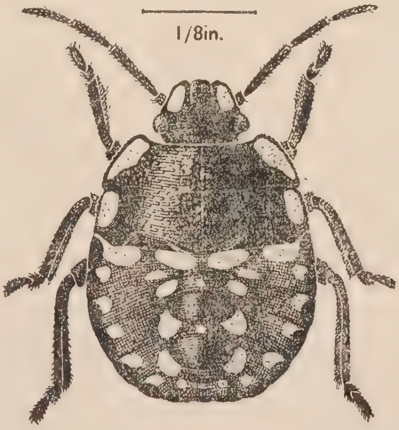
Apart from its powers of dispersal by flight, *Nezara* is spread in its nymphal stages during the distribution of flowers, fruit, and vegetables.

The green vegetable bug belongs to that group of insects which grow by a succession of moults, the green adult emerging at the last moult. The immature stages or nymphs differ greatly from the adult in both colour and shape. When the bugs hatch from the eggs they are little larger than a pinhead and spherical. During immature stages they are brightly coloured, being marked with black, red, orange, yellow, and green. In the last of the nymphal stages two distinct colour forms occur, one of which is predominantly green, the other predominantly black, but intermediate colour forms also occur. The adult bug invariably is green during its active breeding period, but as winter approaches purplish-brown specimens may be found. The adult is shield shaped and, unlike the nymphal forms, has two pairs of fully-formed wings and can fly actively. Scent glands on the lower surfaces of the bugs produce an unpleasant odour, especially when they are handled roughly.



[*R. Blick photo (after Priesner).*
Microphanurus basalis adult female wasp.

Two other bugs may be mistaken for *Nezara* in their immature and adult stages. The adults of both *Nezara* and the native *Glaucias amyoti* are about ½in. long, but *Nezara* has three white dots along the front margin of the central triangular plate; these dots are absent in *Glaucias*. The second bug which may be mistaken for *Nezara* is *Cuspicona simplex* Wlk., a native of Australia which has been introduced accidentally. Like *Glaucias*, it is a shinier green and does not have the three white dots, but the adults seldom exceed ⅓in. long.



[*Photograph by R. Blick from New South Wales Department of Agriculture Insect Pest Leaflet No. 5.*
A fourth-stage nymph of *Nezara viridula.*

Distribution and seasonal irregularities affect the number of generations and the time taken for each generation of *Nezara*. Probably in all areas in New Zealand the breeding cycle is interrupted during winter. Over-wintering adults may emerge from hibernation and begin mating early in spring. About a week after mating the eggs are laid.

The eggs, which are about the size of a pinhead, are deposited in groups in parallel rows glued firmly together and to the surface on which they rest. The groups, which usually consist of 60 to 80 eggs, are for the most part approximately round, but if laid on a narrow leaf, they may be drawn out into a strip four or five eggs in width.

Eggs are usually deposited on the lower surfaces of leaves. When first laid they are pale yellow, but as the embryo develops the eggs show a central pink spot which gradually spreads and darkens as hatching approaches.

The incubation period is about 10 days. When ready to emerge the bugs push off the circular caps on the tops of the eggs and crawl out, leaving a raft of tiny clear cups. The young bugs, which are about 1/10in. in diameter and brightly marked with orange and black, usually remain clustered together on or near the empty egg raft for several days. Before the adult bugs emerge the nymphs moult on five occasions, during which time they are brightly coloured.

The life cycle of the bug is estimated to occupy about 8 weeks during the most favourable summer conditions of Northland. Here all stages of the bug are present for at least 6 months of the year, and probably at least two generations of the bug occur in addition to those which over-winter. The adult bugs hibernate in long grass, foliage, and hedges.

During the breeding season *Nezara* in all its stages feeds actively by pushing the fine sucking mouth parts into plant tissues and withdrawing the sap. No obvious mutilation accompanies their depredations, but growth stops and tissues already formed die away.

Plants attacked include not only those which are grown commercially, but also weeds, grasses, and native shrubs. *Nezara* has been observed breeding very successfully in weedy, neglected gardens and alongside roads in areas which are miles from cultivated land.

THE GREEN VEGETABLE BUG . . .

Flowers, developing seed, growing points, and foliage are attacked. The developing seed in legumes is particularly attractive to the bugs; pods become shrivelled and distorted and little seed formation occurs. This is particularly noticeable in beans. Fruits which are attacked become mottled and discoloured and fall prematurely. Included in plants noticeably attacked in Northland are beans of all types, peas, *Dolichus*, clovers, tomatoes, potatoes, native solanaceous plants, tree tomatoes, mustard, cabbages, cauliflowers, turnips, silver beet, pumpkins and marrows, maize and sweet corn, grapes, banana passion fruit, rhubarb, and thistles. Damage to peaches has also been reported.

Control Measures

Two parasites are known to control *Nezara*. One of these, a small hymenopterous egg parasite, *Microphanurus basalis* Woll. (*Scelionidae*), has recently been introduced into New Zealand. It is hoped that the other, a fly *Trichopoda pennipes* Fabr. (*Tachinidae*), will be introduced later. *Microphanurus* is a wasp-like insect about 1/25in. long. It lays its eggs in those of *Nezara* and the adult parasite hatches out about 3 weeks later. Early this year several hundred of the egg parasite were received from Mr. F. Wilson, Division of Economic Entomology, Canberra, Australia. (The parasite was introduced into Australia from Egypt in 1934.) A temporary breeding station was set up in the Bay of Islands, where conditions appeared to be favourable for the work, and there some 48,000 parasites were bred by the writer. The main areas of liberation* were Awanui, Kaitaia, Paihia, Kawakawa, Whangarei, New Plymouth, and Te Kaha (near Opotiki). In three of the northern areas where liberations were made subsequent examinations showed parasitised egg masses and emerging parasites at the liberation sites. The success of these liberations cannot be assessed for some time. If a measure of control is obtained, it is likely to be more noticeable in the warmer coastal areas.

Results of spray trials carried out by the Department of Agriculture in New Zealand are not yet available. Recent experiments with D.D.T. dusts and sprays in Australia gave promising results. Weekly spraying with 0.2 per cent. D.D.T. in a suitable solvent has given satisfactory control. Sprays are more effective against the immature stages of the bug. The adults, in addition to being more resistant, are able to fly and readily move from place to place.

As the bugs breed and hibernate in rough wastage areas and spread rapidly in the adult stage, destruction of hibernation sites and hand picking have limitations as control measures. However, the destruction of possible hibernation sites, the burning of old infested plants, and the destruction by hand of adults and nymphs, particularly those found early in the season, can all aid in reducing the *Nezara* population.

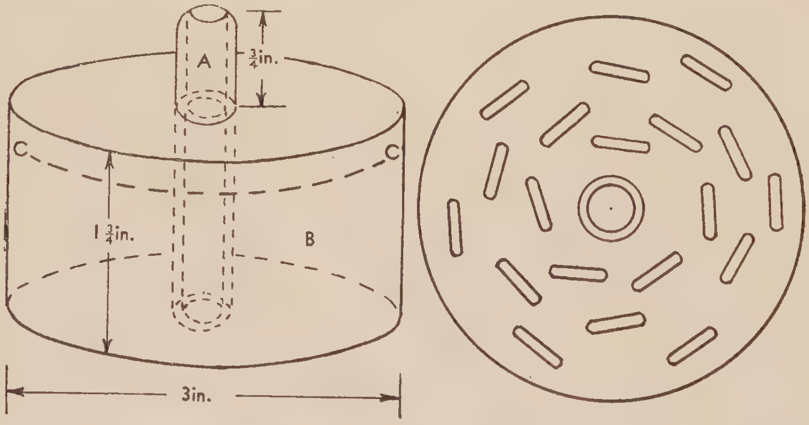
* Assistance in field work and parasite liberations was given by W. Delf, Paihia, A. A. Sneddon, Maori Affairs Department, Opotiki, and officers of the Department of Agriculture at Kaitaia, Whangarei, New Plymouth, Kaikohe, and Tauranga.

Artificial Teat for Starting Calves on Bucket

A DEVICE for starting calves on the bucket which does away with hours of back-bending and saves fingers from being bitten has been devised by Mr. G. Macpherson, of Kaitaia, Northland. It consists of a piece of milking-machine claw rubber passed through a weighted fishing-net cork which floats well down in the milk. The calf draws milk through the upper end of the rubber which, by being subjected to heat, is moulded to teat shape and is softened so that it gives a spongy feel when in the calf's mouth. Mr. Macpherson has found that calves seldom need to be started on this device more than once and that after a week it can be removed and the calves will drink straight from the bucket without noticing the absence of the artificial teat.

Mr. Macpherson used large staples to weigh the cork down in the milk, and the weight of the staples also prevents the calf from lifting the float out of the bucket. Staples are arranged so that they prevent the cork from splitting (see diagram).

Corks used for making the device, as far as possible, should be free of air holes. Mr. Macpherson has found that if corks are scalded daily they will last for several seasons.



Left—Side view of device. A—Claw-rubber. B—Fishing-net cork. C—Level of milk. Right—Showing how the staples are arranged in the bottom of the cork.

BOOK REVIEW

"The Shepherd's Dogs": C. W. G. Hartley

THIS is a most interesting and instructive book based on 25 years' experience in training dogs for mustering and trial work.

The training described starts with the pup 3 to 4 months old and by patience, encouragement, and progressive lessons the aim is to produce a dog that can be relied on in all circumstances and will work in an attractive manner. Illustrations show dogs being trained and working sheep. Two separate methods of training heading dogs are explained, one for the heading pup and the other for the young dog ready to work.

Chapters clearly describe the training of huntaways, and all-round, leading, backing, and trial dogs and the correction of common faults.

The section "Teaching a Puppy Tricks" should have a wide appeal to dog owners, and the photograph of the dog Trojan using his paw to tap a stubborn sheep on the nose rather than bite it illustrates the successful training he has received. Those who have broken in dogs by the rough and ready methods too often used because of lack of time and the necessary patience should find the chapter "Training the Dog Trainer" illuminating.

For the portion of the book "Judging of Sheep Dog Trials" the author draws upon the experience of a successful trial judge and competitor of 50 years' standing, and this section is intended to serve as a guide to all dog-trial competitors.

This is a valuable book and should be of interest to all dog owners keen on getting the best work out of their dogs.

—*G.L.W.*

Whitcombe and Tombs Ltd. 6s.

CARE OF PIGS DURING SUMMER

SUMMER, with harvesting and all its attendant worries, is an extremely busy time for the farmer. It is a time, too, at which pigs require a certain amount of attention and though it may be difficult to give it, neglect is apt to be costly. In this article I. H. Owtram, Extension Officer in Pig Husbandry, discusses various aspects of pig keeping that apply more directly to summer.

BY this time of year the majority of the early-spring litters are rapidly approaching bacon weight and probably are occupying the fattening pens. Care should be taken to see that in feeding them food is not wasted, as pigs of this size will consume an enormous quantity of food if they are fed unlimited amounts. This, however, does not tend to produce a good carcass, and some restriction in feeding should be practised. When feeding skimmed milk—pigs approaching bacon weight can be finished off satisfactorily on this feed alone—the quantity should be kept down to not more than 6 gallons a day; in feeding whey as much as 10 gallons can be given, plus, of course, the ½lb. of meal per day, which is essential for good results with whey feeding.

It is possible that under these conditions of feeding there may be a surplus of skimmed milk; in fact this is usually what causes wasteful feeding of big pigs in the fattening pens, because it may seem to be the alternative to throwing the surplus away. However, there is no need to do that, as skimmed milk can be preserved simply in the form of curd, either in drums or in tanks. Briefly, this can be done as follows:—

Surplus skimmed milk is placed in a drum or other container and left for the curd to set. When the curd is set sufficiently for it to come away from the side of the container cleanly when the hand is pressed on the edge of it, it is ready to be broken, which is done simply by stirring. The curd will then sink to the bottom of the container and when this happens all the whey, which is now at the top, is drawn off, with the exception of 3 or 4in. covering the curd. More skimmed milk can then be added daily and the curd will be found to sink of its own accord without stirring. Surplus whey is removed, a few inches being left to cover and seal the curd.

It is essential that containers used for storing curd should be clean and in addition to being washed thoroughly before use they should be washed out with a 1 per cent. formalin solution (about 1 teaspoon per gallon of water), after which they must be rinsed thoroughly with clean, cold water.

Access to Good Grazing

Pigs that are being finished off in the fattening pens should, if possible, be allowed access to a run on good pasture at least twice a week, even if it is only for half a day. This will assist materially in keeping them in good order. If it is not possible to provide grazing, pigs should be given a little green feed—lucerne is ideal and fresh lawn mowings are also useful—in the pen. It must be remembered that a pig will not consume a very large quantity of green feed at a time and too much must not be given at once or the pen will be fouled. The quantity fed should be such that the pigs clean it up before the next feed. In very hot weather, providing that the housing is really good, it is better to let the pigs out at night than during the day.

Pigs running outside in summer must have shade, but shade without draught. In hot weather there is always a cold draught under big trees, especially when they are planted in a row, and such situations should be avoided. Where pigs cannot be prevented from lying under big trees a windbreak should be arranged under the trees. If there is no natural shade, artificial shade should be provided. There are numerous ways of doing this, but whatever method of supporting the shade is adopted, the actual top should be made from branches of trees, rushes, manuka brush, or some similar material. Old corrugated iron sheets are of little value, as below them it is generally hotter than outside.

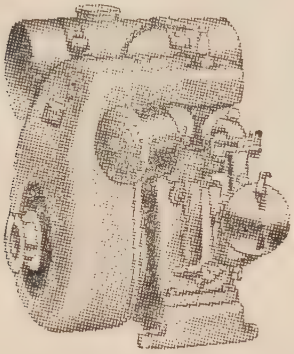
Summer Farrowing

Sows farrow their summer litters from the end of November and preparations for this should be made well ahead. A thorough cleaning out of farrowing houses, which should include the use of a good disinfectant, is advisable. This entails scrubbing out the whole house with caustic

HEADING PHOTOGRAPH: Sows feeding on their daily ration of apples.

Villiers

The Light-Weight Engines
Unsurpassed for Reliability,
Economy, and Efficiency

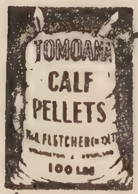


VILLIERS Engines are tigers for hard work; their sturdy, simple construction and precision-engineered parts ensure maximum dependability and efficiency at lowest cost.

Obtainable in 1h.p., 2h.p., 2½h.p. Models

N.Z. Factory Representatives:
F. W. CAVE LIMITED,
P.O. Box 1685, AUCKLAND.

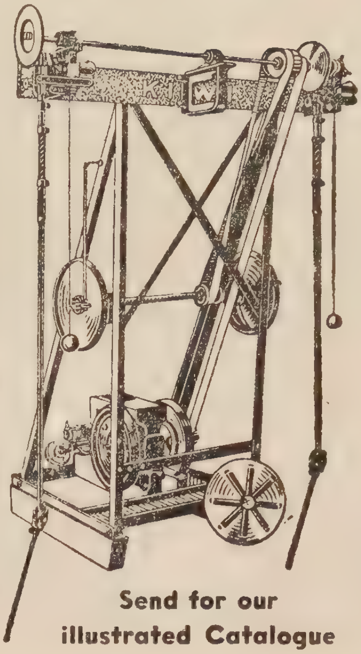
V E 4/49



PREVENT
that
CHECK
at
WEANING

TOMOANA
CALF PELLETS

Specially made for
DRY FEEDING



**Send for our
illustrated Catalogue**

KIWI PORTABLE
SHEARING
MACHINE

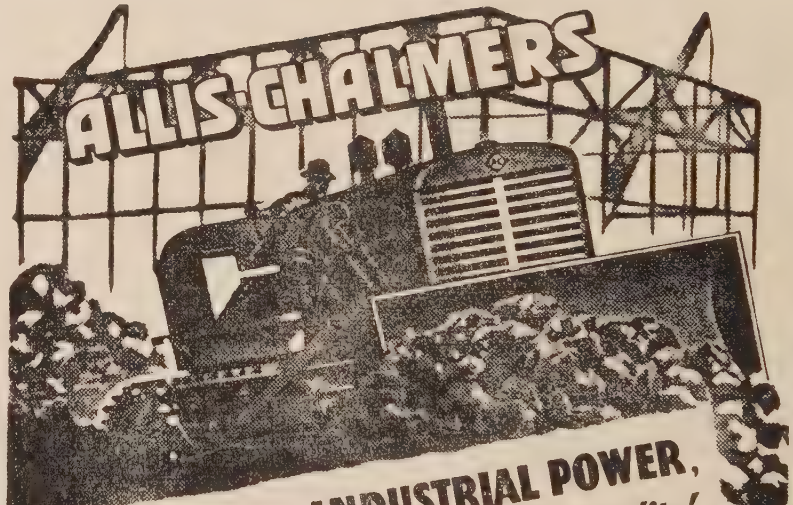
makers of

**PORTABLE ELECTRIC
STANDARD MIDGET**
Sheep Shearing Machines

Write for full particulars

NEW KIWI
SHEEP SHEARING MACHINE CO LTD

90 FEDERAL STREET - - AUCKLAND



—last word in INDUSTRIAL POWER,
FIRST in economy·stamina·dependability!

Where there's work to be done at minimum cost on any construction, earth moving, or logging project, ALLIS-CHALMERS industrial Tractors set the pace for savings, results, rugged dependability. They're powered to stand tough work, bad footing, long hours—are a decisive factor between profit and loss. Long work periods between overhauls and minimum expense when service is needed make ALLIS-CHALMERS the real stand-out industrial tractors in preference today.

**North Island Distributors
For Allis-Chalmers Industrial Tractors:
THE DOMINION MOTORS LTD., WELLINGTON.
Dealers in all Main Towns.**

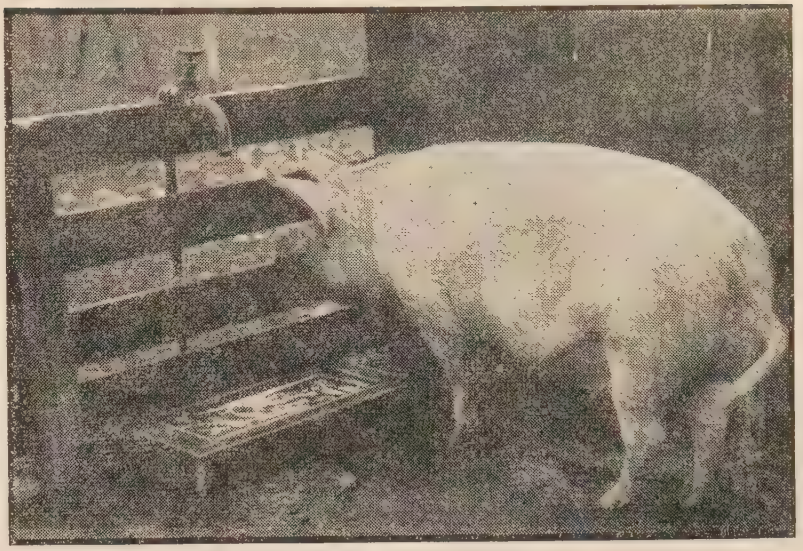
soda solution and applying the disinfectant through a spray pump if possible. As it is important that the house should be perfectly dry when the sow goes into it, cleaning should be done well ahead of the time that the house is likely to be wanted.

Every effort should be made to keep the pasture in farrowing paddocks short and leafy, though this is not easy at a time when growth is at its maximum. The easiest way of controlling pasture is to graze a few sheep on it, but ewes and lambs should not be used, owing to the danger of infection either to pigs or lambs with arthritis. Wethers, hoggets, and rams are quite satisfactory. If sheep are not available it may be necessary to run the mower over the pig paddocks.

However, in dealing with summer litters, it is possible to provide pigs with good, young leafy pasture, and every effort should be made to do it.

Farrowing houses shoud be cool in summer; all ventilation openings should be kept open whenever possible. Unsarked, corrugated-iron roofs will prove particularly unsatisfactory in hot weather and it is best to take them off and put sarking of some sort under them—old sacks nailed to the purlins will do if better material is not available. As an emergency measure a thick layer of old hay can be placed on a roof which is not sarked. This is quite effective, especially if at the same time an opening is made at the back of the house immediately under the roof so that a current of air can flow under the roof and over the pigs.

The question sometimes arises as to the advisability of allowing sows to farrow outside in summer. If really good shelter is available in the form of scrub or pampas grass, satisfactory results can be expected, but in view of the lack of control over the sow in the event of the weather deteriorating, it is advisable, if possible, to avoid having a sow farrow in the open.

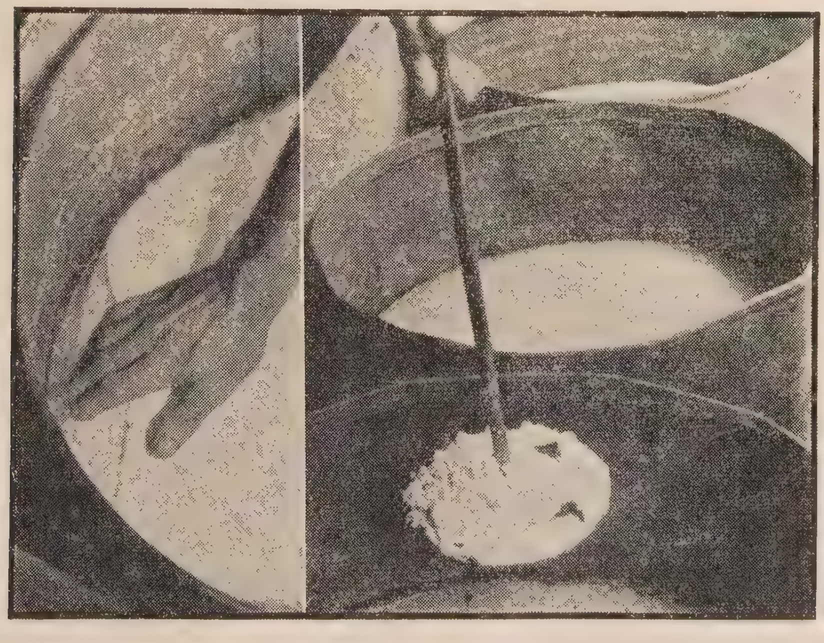


[*"New Zealand Farmer"* photo.

The provision of clean drinking water is most important.

Adequate Drinking Water

The provision of an ample supply of drinking water for the sow in the farrowing unit is most important, as lack of water to drink is probably a frequent cause of sows having a poor showing of milk; cows will not milk without a good supply of water, and neither will sows. Built-in water troughs of such a size that the sows cannot get into them are by far the most satisfactory receptacles.



[*"New Zealand Farmer"* photo.

Preserving skimmed-milk curd. Left—Curd at the right consistency for breaking. Right—Preserved curd.

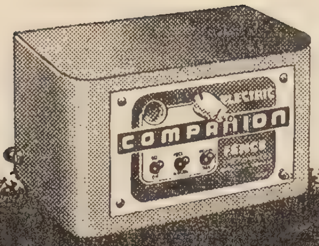
Care is necessary with very young pigs to prevent them getting sunburnt. It is a mistake to think that only white pigs suffer from sunburn; coloured pigs when very young are just as susceptible as white pigs, and it is most necessary in really hot weather to protect young pigs under 3 weeks old from the sun. Where housing conditions are good and adequate shelter is lacking it is advisable to keep sows with very young litters inside during the day and let them have the run of the paddock at night. After piglets are 3 weeks old they can be oiled with waste crank-case oil. but before this age oil is apt to scald them.

Feeding Weaners and Slips

As the supply of skimmed milk and whey is plentiful in summer weaners and slips are frequently given too much liquid food. This results in "ballooning" and not only causes slow growth but frequently permanent damage to the digestive organs. It is absolutely essential that concentrates in the form of meat meal and, if possible, a grain meal, should be fed to pigs of this size at a rate of up to 1lb. per day, and they should have access to good pasture and a water supply.

In summer especially it is necessary to prevent pigs from wallowing in mudholes into which drainage from the piggery or cowshed can run. Mud wallows are one of the most certain avenues for the spreading of disease and any mudholes should be fenced off or, better still, eliminated. A wallow in a clean creek is excellent, but one in the manure sump definitely is not.

Summer is an extremely busy period on the farm, but by careful organisation it should be possible to attend to special seasonal operations such as haymaking and silage making and yet give pigs adequate attention.



Saves Wire!

COMPANION

ELECTRIC FENCE

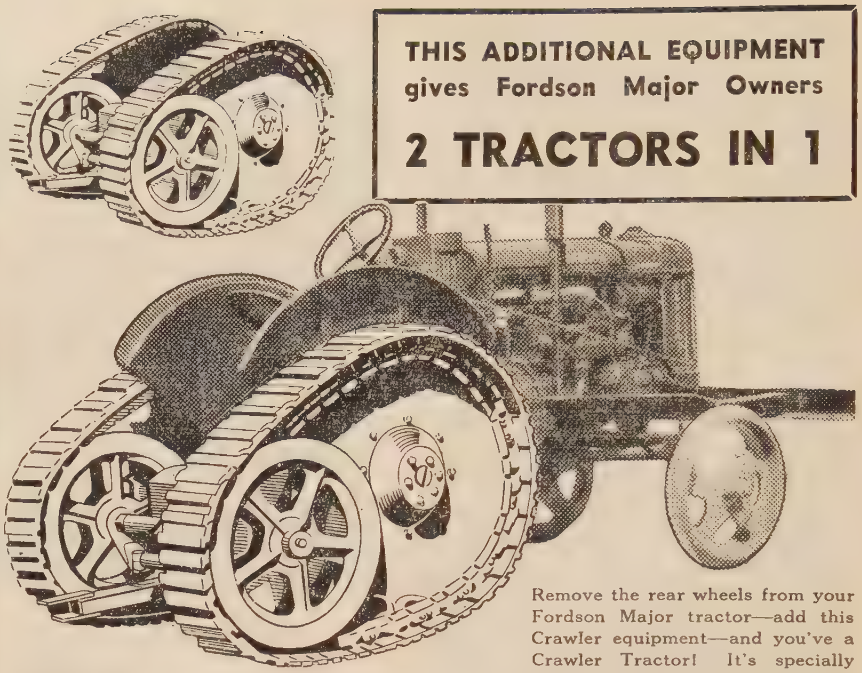
USE IT ANYWHERE
ONE YEAR GUARANTEE
WRITE FOR DETAILS

JOHNS LTD.

JOHNS BLDGS. BOX 471 AUCKLAND

THIS ADDITIONAL EQUIPMENT gives Fordson Major Owners

2 TRACTORS IN 1



Remove the rear wheels from your Fordson Major tractor—add this Crawler equipment—and you've a Crawler Tractor! It's specially designed for Fordson Major Tractors—and what advantages! It provides crawler performance at far lower cost! It gives you two tractors in one! **Price complete, fitted, is only £332. Get full details from your nearest Ford Dealer.**

Fordson
Major

CRAWLER
EQUIPMENT

FORD MOTOR COMPANY
OF NEW ZEALAND
LIMITED
Lower Hutt.

195.9

The New Scientific
rat killer that

KILLS AT A TOUCH

RANTU
RANTU

Sprinkle RANTU around rat holes and runways . . . the rat picks up the dust, licks his feet and dies within 12 or 48 hours, usually outdoors. 100% effective. This special preparation of Alpha Naphthyl Thiourea is now available at all stores in 3oz tins or larger sizes.

ASHE

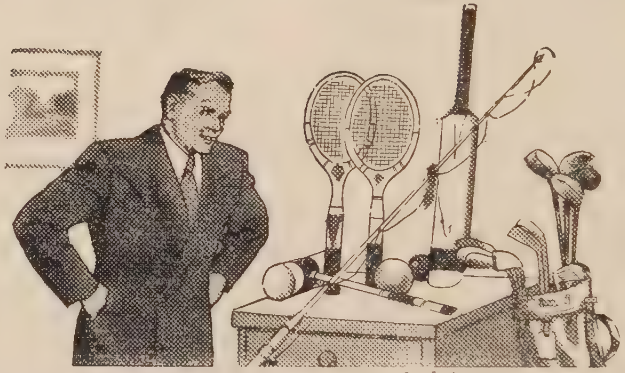
Distributors: T. A. MACALISTER LTD.,
12 Albert St., Auckland.

SPEEDWAY

LOW & HIGH PRESSURE
OIL BURNING
BOILERS

Write for
free illustrated catalogue to:
SPEEDWAY PRODUCTS LTD
51 Albert Street, Auckland

SB-1-2



For a Happier,
Healthier Summer—

CHOOSE THE OUTDOOR EXERCISES
THAT ARE BEST FOR YOU

Summer weekends and holidays are ideal times to enjoy healthy outdoor exercise, and to get yourself in good physical condition for Autumn and Winter. You should, however, be careful not to *over-exercise.*

The businessman in the middle years of life who works in an office all week and over-exerts on weekends may do himself more harm than good. So choose activities that are suitable for your age. Better still, check with your doctor and follow his advice as to the kinds and amount of exercise *you* can enjoy safely this summer.

ISSUED BY THE NEW ZEALAND DEPT. OF HEALTH

The Production of Pasture Seed in Canterbury

IN the last 20 years pasture-seed production in Canterbury has undergone major changes largely through the increase in Certified-seed production, improved methods of pasture management, and the superseding of the old threshing methods by the header harvester. In this article, which was presented as a paper at the 1948 conference of the New Zealand Grassland Association, J. G. Slater, a farmer of Hilton, South Canterbury, deals with these changes and outlines the practices and methods necessary in pasture-seed production in Canterbury today.

THE demand for an ample supply of pasture seeds has always existed in areas where arable farming is practised and the demand for good seed has increased with the knowledge of the influence of strain and its effect on the production and life of pastures. As a result there is now a fairly stable demand for more highly productive types and strains of seed for both resowing arable land and for resowing those areas which are used solely for herbage production. As pasture-seed production demands similar conditions of soil, climate, and contour as the production of cereals and other annual crops it is natural that Canterbury should be the largest producer of pasture seeds, the main kinds of which are ryegrasses and clovers.

In order that the present and, if possible, the future position of pasture-seed production and its relationship to arable farming may be appreciated it is necessary to understand the facts leading up to the present situation.

Up to about 1930 the method used by Canterbury farmers for sowing pasture was to sow down with wheat or other cereal or rape or turnips about a bushel of "ryegrass" with 2 or 3lb. of red clover. One of the areas sown was left for ryegrass seed in the summer of the following year and after sufficient seed was kept for the following year's requirements the surplus was sold. Red clover was saved for seed after an early hay crop, and white clover was sometimes taken in suitable seasons from stubble areas which had been left over from the previous harvest.

In short, pasture was considered secondary to cropping, and pasture seed was taken only to save the expense of buying. This was the situation up to 1930; paddocks were sown down only to give them a spell, the use of lime was considered unnecessary, and superphosphate was still regarded by most farmers only at the best as a stimulant and not a necessity to crops.

Production of Ryegrass Seed

Ryegrass-seed production in Canterbury received its first modern impetus with the sowings of "Hawkes Bay" ryegrass sown under contract about 1929-30. As a result of this the pendulum swung back, and but for the strenuous efforts of a few this initial effort would have ended in disaster; even as it was it retarded development for some years. The pure sowing of ryegrass without clover on cropped land, without lime, and with little phosphate was, as is well known, the cause. In fact the only feature which kept the project alive was the price, another stimulant which was ultimately to react against the true development of pasture-seed production and its relationship to arable farming.

During the boom-price period pasture seeds were produced for their return per bushel or pound of seed rather than their yield per acre. Machine-dressing loss and quality were forgotten in what can be termed the mad rush for the buried treasure of small seeds, a treasure which only a few ever found. This culminated in the collapse of the market, the causes of which were receding prices, record areas, bad harvesting conditions, and disease.

Period of Formation

Those 15 years of alternating periods of hope and despair can be regarded now as a period of formation and development during which the true relationship between seed production and arable farming was straightened out. Lessons were being learnt and applied throughout this period which have gradually placed seed production on arable land in its true perspective.

It has been proved that, first, pasture-seed production on a catch-crop basis as a quick revenue earner is risky, and, secondly, that it is not sound practice to devote the farm wholly to seed growing and to ignore the use of livestock in arable farming.

Like any other business, whether farming or commercial, seed production resolves itself into one routine. Certain operations must be carried out annually and throughout the farming year to ensure continuity in production and revenue and to avoid failures.

It has been claimed, and rightly so, that on many farms throughout the 15-year period from 1930 seed growing reduced the areas of crops and the number of sheep carried and fat lambs produced. This, however, has taken place only on those farms (and they may still be in the majority) where haphazard methods have been used. On farms where seed production has been dovetailed into arable farming combined with sheep raising and where the lessons learnt through the development period have been applied land fertility, crop production, and carrying capacity have improved and revenues have increased.

Use of Built-up Fertility

The basis of sound arable farming is a constant annual supply of first-year harvest paddocks of perennial, short-rotation, or Italian ryegrasses and second-year paddocks of red or white clover sown under conditions suitable to the establishment and growth of pasture seed—conditions which make full use of built-up fertility by adequately-limed and fertilised land and a good fallow and cultivation and which encourage the crop and make the maximum use of the initial vigour which all plants and animals possess in youth.

The basis of all first-year harvests is, of course, yield, and high yield has been found to be associated with high

The use of high-producing strains of grasses and clovers, together with lime and phosphate, has done much to increase the fertility of the arable rolling country in Canterbury.

purity and low machine-dressing loss, and, in the case of the ryegrasses, good germination or less susceptibility to blind-seed disease. These first-year harvests mean a fairly short-lived period that the paddocks are down to pasture if any area is being saved, but this procedure fits in comparatively well where conditions are such that winter and fattening feed have to be grown because they are essential or as a safeguard. In order to maintain continuity it is necessary that after two seed crops, one of ryegrass and one of clover, the paddocks are still good feed producers for the rest of their lives, which depend on the length of the rotation.

Production Programme Intensified

From this it can be seen that, provided the saving of pasture seeds on an arable farm is carried out on the proper basis, it intensifies the programme of production. Though as a rule the length of life of a pasture is too short where seed production is combined in the programme, the pasture never reaches the stage of becoming worn out and unproductive. The system also ensures that the sowing of a paddock to grass becomes the final operation of the cycle for that particular area. This means that all the effort goes into seeing that the procedure is successful, so that pasture establishment becomes of first priority instead of being pushed into the background as in former days. Livestock numbers and the crop-pasture ratio, together with the fallow area and liming and topdressing area, become more stable; a condition which is ultimately reflected in the well-being of the farm.

The closing of paddocks for seed takes place when grass growth is starting to make its maximum development and surplus feed is beginning to show, and this is an advantage, for it is generally recognised that in Canterbury stocking up to late-spring and early-summer capacity is not wise. Of course, this surplus could be made into hay, but the revenue obtained from an average seed crop has been found to be one of the best ways of balancing the budget on average-sized holdings in South Canterbury. In arable farming the whole secret of success seems to be in not letting specialisation in any particular feature, whether seed, sheep, or cereal, dominate the position to the detriment of the others. Otherwise the balance is upset, and once upset it is difficult to restore. The tendency of the seed producer is, of course, to save too great an area for seed, the temptation being to save older paddocks as well as newly-sown ones. This procedure reacts against the well-being of the livestock on the farm, and consequently the ewes and lambs suffer. Sometimes grazing is obtained elsewhere, but this is not generally satisfactory.

From experience it appears that seed production is less complicated when the farm on which it is practised is on what can be termed a rising plane of fertility. The difficulty is more the improving of the land so that the seed can be grown rather than the actual growing of the seed, which is more or less the result of experience from season to season. Under low-fertility conditions it is difficult to obtain harvestable and payable crops, and in the case of ryegrass it is well known that it takes quite "a bit out of the ground." At the other end of the plane, that is, under high-fertility conditions, it is again difficult to obtain harvestable crops because of too much growth and consequently poor ripening and difficult harvesting conditions. It must be remembered that the grasses and clovers used for seeding are types that have been produced for leaf rather than for seed; they like high-fertility conditions, making leaf to the detriment of the seed yield.

The creating of this upward trend of fertility is therefore as necessary in seed production as it is in every phase of farming if success is to be achieved.

The beginning of a set rotation, including seed production on arable farms in Canterbury, will be governed by the set-up of the individual farm, in which consideration has to be given to contour, fertility, and previous farming practice.

On a farm where a rotation that includes roots and fodder crops, peas, linseed, and linen flax out of lea ground is followed by cereals a start is made with the establishment of pasture for seed production after the cereal crop. The basis is a fallow from autumn to autumn, coupled with good cultivation, adequate liming, a liberal manuring, and the use of a good seed mixture. Good husbandry gained through experience under average conditions should enable payable pasture and seed crops to be obtained.

Area Sown to New Pasture

The annual area sown to new pasture should correspond as near as practicable to the annual area broken up out of old pasture, which for all practical purposes can be taken as a tenth of the area of the farm. Once ploughed, the area will be out of grass for approximately 3 years. This means about three-tenths of the farm is under cultivated crops and fallow, a tenth in first-year ryegrass for seed, and a tenth in second harvest as white or red clover for seed. This amounts in all to about half the holding, leaving the other half for grazing purposes in 2- to 6-year-old pasture.

The stocking of the grazing pasture should be up to full capacity, reliance being placed on the supporting feed to be obtained from the first- and second-year seed stands in times of scarcity, etc. With this well-spread programme of work there will be few idle moments, but it is one that is well within the capacity of a modern mechanised plant on a Canterbury arable farm.

The practice adopted by the writer for pasture establishment, with the aim of producing as great a yield of quality seed as possible from the area, can be summarised as follows:—

Thorough preparation of the seed-bed with good cultivation is necessary after a lengthy fallow. The final workings should be of a surface nature only, and at least 1 ton of carbonate of lime should be applied before the firming of the seed-bed. It will be seen that in combining seed, feed, and pasture it is necessary to sow in late summer or autumn so that the initial vigour will be carried through and the highest possible yield of ryegrass seed will be obtained.

Methods of sowing the seed vary. Where perennial ryegrass is being used broadcasting a mixture of 30lb. of perennial ryegrass with 3lb. of white clover and 2lb. of crested dogstail per acre is generally favoured. When Italian ryegrass is sown it is usually drilled at the rate of 25lb. together with 4lb. of broad or Montgomery red clover. For short-rotation ryegrass used either with red or white clover drilling and broadcasting seem to find equal favour. The method used by the writer is to drill a bushel of ryegrass with a liberal sowing of superphosphate and to broadcast about ½ bushel of ryegrass with 3lb. of white clover or 4lb. of red clover and 2lb. of crested dogstail through the front box of the drill in late February or early March.

In seed production it is, of course, essential that the highest grade of Certified seed obtainable is used in all the species sown in the mixtures.

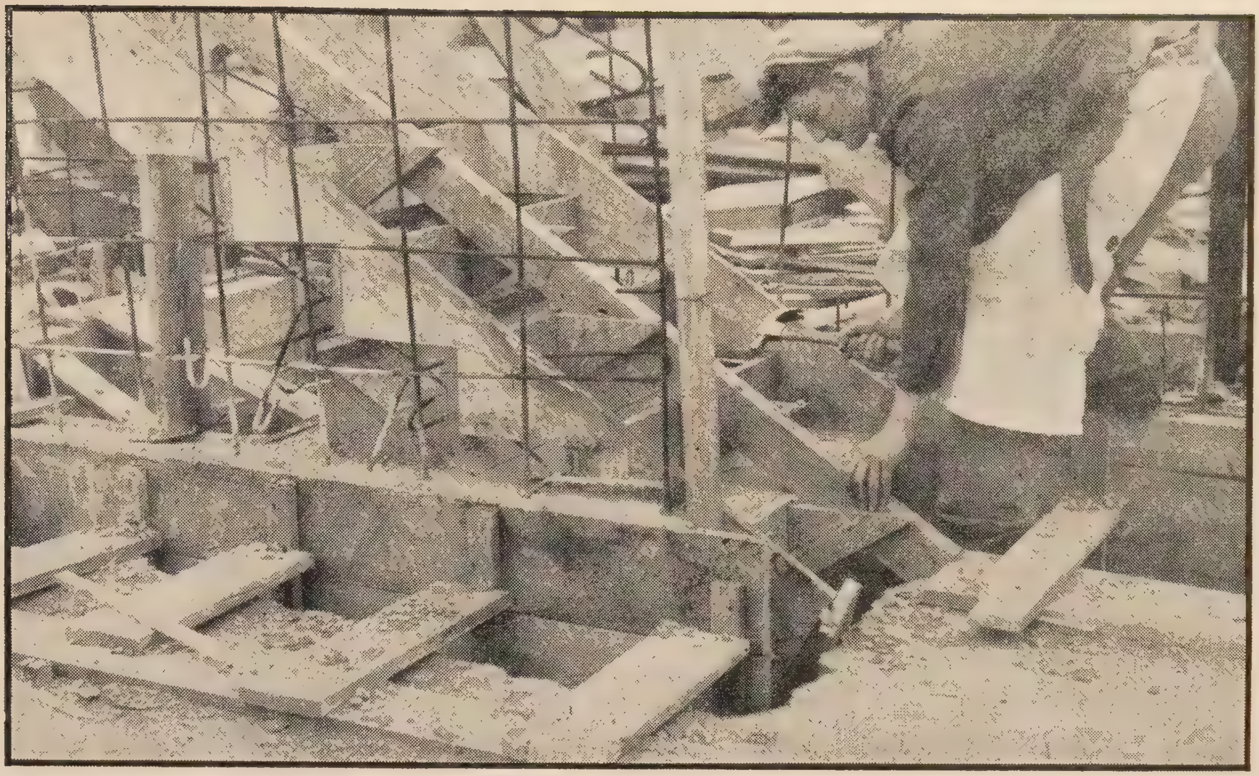
Management in Autumn

The management of the newly-sown areas in autumn and early winter is to stock as soon as possible and to graze off quickly and allow time for recovery. In spring before the closing of the area the practice is not to hard graze, but rather to lighten the grazing just to keep the flaggy top off and give the plants a chance to bring every tiller to a seed head. Finally, the stock should be taken off when definite signs of heads are appearing. By this time growth will have reached a height of 6in. or more and will almost certainly mean a lodged crop, which, according to an old saying, "ruined no man." With these conditions high yields result, with which are associated higher germination.

The treatment of the final closing up of a white clover area is somewhat different; treatment can be harsher and shutting up later. On average moist, clay subsoils a good sprinkling of flowers appears before closing off the areas. The right time to shut up the seed-production areas is learnt from experience and a thorough understanding of the soil type and rainfall.

For the first 2 or 3 years after the beginning of such a programme there appears to be nothing but hard work and heavy expenditure in fuel, fertilisers, lime, and seed. But once the rotation begins to take shape enthusiasm begins to increase. The result of the work begins to show in an improved holding and increased returns, the farmer begins to see that he is making progress, every step is of interest, and it takes a major upset for anything to fall out of place in the cycle.

◆



The Use of Reinforcing and Boxing in Preparing Concrete

IN the first article of this series, which was published in last month's issue of the "Journal," H. W. T. Eggers, Engineer, Department of Agriculture, Wellington, dealt with the properties and methods of working concrete. This article describes reinforcing and forms, and the third article, to be published in next month's issue, will describe concrete bricks, pipes, and posts.

THE greatest strength of concrete is compressive, and if any other stressing is to be given a concrete structure, this stressing must be provided for by the use of steel reinforcing. From this it will be realised that as reinforcing is used for a special purpose, to gain the maximum strength with the greatest economy, the sizing and position of reinforcing must be arranged in such a manner that the size is suited to the degree of stress and the position to the line of stress.

Reinforced concrete is therefore a combination of concrete and steel acting as a unit as a result of the adhesion between the two materials. Beams of plain concrete fail by tension under very low stresses, but if reinforced by the embedment of steel in their tensile portion, they may be stressed to the compressive working limit of concrete.

Reinforced-concrete structures are practically monolithic, more rigid than steel, and substantially fireproof. Reinforced concrete is used in parts of the structure in which tensile and compressive stresses exist, such as beams and slabs, and also in members subject to secondary bending stresses such as columns and struts. Reinforcing is also used to prevent cracks caused by changes of temperature and shrinkage, as in walls.

The use of reinforcing placed without regard to the work it is supposed to perform is a waste of material and labour, because unless the reinforcing is placed along the lines of stress, the structure is no stronger for its presence. If, on the other hand, the sizing and positioning of reinforcing are designed in correct relation to the stresses involved, the quantity of reinforced concrete required for any given loading will be considerably less than any unreinforced concrete used for the same loading.

Reinforcing Steel

Reinforcing steel is generally ordinary mild steel supplied in the shape of bars, plain round bars being most extensively used. A number of deformed bars (that is, bars with irregular surfaces) have been designed to produce mechanical bond and greater adhesion between steel and concrete. For all ordinary work plain bars may be used with safety, though deformed bars are of advantage in resisting temperature stresses. Fabric reinforcing, such as triangular mesh, expanded metal, welded wire, etc., is adapted in certain cases for slabs, walls, or partitions, or moulded articles such as watering troughs. Usually, however, bars are more economical.

All steel used for reinforcing should stand bending cold to an angle of 180 degrees around a diameter equal to that of the piece tested, without fracturing the skin at the bend.

It is of the utmost importance that all steel is clean and free from rust and that all scale is removed before fixing in the work.

In the work all cross rods must be sufficiently tied to the longitudinal rods so that the reinforcing forms a rigid mat which will not be displaced by the placing of the concrete. Soft-iron wire is the best material for binding rods together. Splices in rods should be lapped at least 40 diameters and securely bound, and all ends should be hooked, except on bars used solely for the purpose of taking temperature stresses.

Fabrics should be lapped for not less than 15in. in the direction of the longitudinal wires, and the side lap should not be less than 3in.

Bending and Fixing Reinforcement

As all steel must be accurately placed and supported in its correct position in the forms, it is very necessary that bending and cranking are done accurately. Bars must be cut to length and bent to fit their respective

Cut phenothiazine drenching time in half with

Elliotts
PHENZEEN PLUS

drenching treatment

Demand is heavy for Elliotts' Phenzeen Plus and the new Elliott Automatic Injector. This ready-mixed liquid phenothiazine in high concentration gives clean, speedy and practical drenching when administered with the new automatic instrument. Ensure utmost efficiency in this season's drenching programme.

BOOK NOW

from your local stockist or write to . . .

PREMIER PRODUCTS LTD.
HUDDART PARKER BUILDING,
WELLINGTON.

SAFEST
with very low centre of gravity and automatic stopping device

FULL 3 FURROW Powerful

World's Finest Tractors and Implements

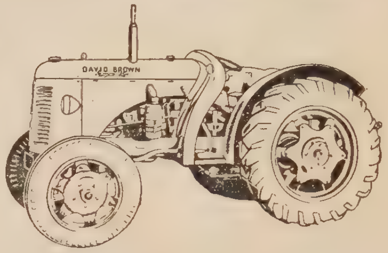
DAVID BROWN

Hydraulic Lift. Oversize Tyres. TWO speed power take off. TWO Speed Belt Pulley. Electric lighting. Self starter. Engine specially built as a TRACTOR engine only to meet the very heavy stresses of tractor work. Quality made to do a better, more economical job.

6 SPEEDS Economical Modern

N.Z.
Distributors:
TODD BROS.
LTD.
Wellington.

Dealers
Everywhere.



PALLO

LEVER
OPERATED

PLUNGER PUMP

. . . handy, efficient, light in weight. Suitable for pumping petrol, kerosene, diesel oil and lubricating oil from drums or other storage vessels. Two models available, each fitted with 1½ inch and 2 inch threaded bung for screwing into 44 gallon drums.

Available through the usual trade channels. If unable to obtain from your local supplier, please communicate with us.

Manufactured by Pallo Engineering Ltd., Wellington.

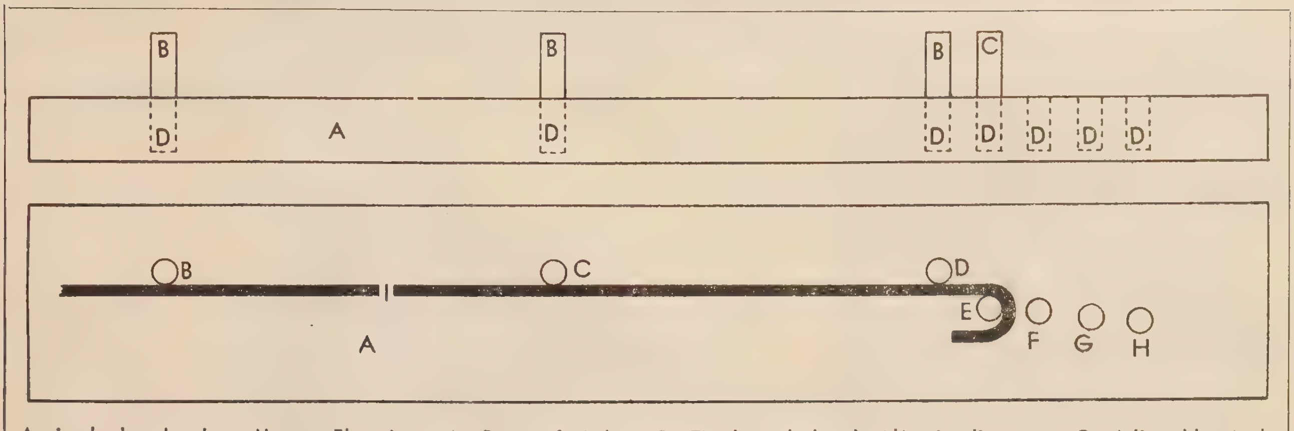
2888

Summer

WHEN the golden grain is harvested and townspeople love to join in the work in holiday spirit to help their country folk and regain their health. Co-operation is the keynote and both town and country people find they are mutually well supplied with banking service throughout the 107 branches and agencies.

THE
NATIONAL BANK
OF NEW ZEALAND LIMITED
ESTABLISHED 1872

USE OF REINFORCING AND BOXING IN MOULDING CONCRETE



A simple bar bender. Upper—Elevation. A—Piece of timber. B—Fixed steel dowels 1¼in. in diameter. C—Adjustable steel dowel 1¼in. in diameter. D—Holes to accommodate dowels. Lower—Plan. A—Timber. B, C, D, E, F, G, and H—Dowel holes. I—Bent bar. For bending ⅜in. diameter rod dowel C (in the upper illustration) is fitted to hole E; for ½in. diameter rod to hole F; for ⅝in. diameter rod to hole G; and for ¾in. diameter rod to hole H.

positions in such a manner that they are easily assembled. Even if they can be assembled, wrongly-bent bars will not occupy their correct positions and are therefore not capable of providing the necessary resistance moments. They may also reduce the coverage of concrete if too close to the forms, causing the concrete to spall off.

When a reinforced structure is designed accurate drawings of all reinforcing are prepared, and reinforcing must be bent exactly as shown in the drawing, as the designers have studied the methods of positioning as well as its strength characteristics. Reinforcing can be ordered already cut and bent according to drawings, but if this work is done on the site, accuracy is essential.

The simplest equipment for bending light bars consists of a number of steel dowels fitting into holes in a baulk of timber supported so that its upper surface is 3ft. to 3ft. 6in. above ground level (see diagram above). A length of gas or water pipe which slips over the free end of the bar is used for pulling the bars round the dowels to make a bend. Simple bar-bending machines are also obtainable and give good results.

The dimensions of tails and hooks on reinforcing bars are of little importance and any excess in length may be taken up at these points. In bending bars with a crank near each end it is advisable to start by making these bends first and using any surplus length of bar in the end hooks.

Forms of Shuttering

Timber

Concrete is worked in a plastic state and can be moulded to any shape required. The moulds, or sections from which the moulds are built, are known as boxing, forms, or shuttering, and consist of either timber or metal. Timber is by far the commonest material from which concrete forms are constructed, but sheet metal is used for special applications where a required profile is more easily obtained by bending a sheet of steel.

Some contractors use sectional steel shuttering which can be bolted together and forms a very convenient means of erecting shuttering for straight-run work such as walls.

The most suitable timber for use as boxing is pine, as it is relatively cheap and, being soft, is easily worked. It is also available in all sizes and is easily obtained.

Freedom from knots and coarse grain is desirable, as these will show on the finished concrete; for this reason white pine (kahikatea) is one of the best timbers to use for mouldings or in any situation where an extra-smooth finish is required. However, white pine is too expensive and has too little strength for form timber generally.

Partially-seasoned timber is the best for form construction, because if the timber is too dry, it will tend to swell from absorption of moisture, and green timber will tend to dry out and shrink in hot weather, causing fins and ridges on the concrete.

Timber may be rough or dressed. It may be dressed in various ways, such as on all four sides, on one side and one edge, on one side and two edges, etc. Generally it is best to use timber dressed on all four sides, as it will then be of more uniform size and is more easily adaptable for different purposes. Wood of any size should be dressed to uniform thickness so that the pieces will match up; this is particularly important with sheathing, because otherwise the joints will require to be planed down.

Sheathing 1 to 2in. thick for straight runs such as walls may be tongue and grooved, square, or have a bevelled edge. Tongue and groove gives the best results, and a bevelled edge is good if the wood is very dry, because when built up it will not buckle so easily when swelling.

Thickness of timber will depend on the available supply and the load to be carried, but more often on the supply, as any normal size can be used to advantage by adjusting the spacing of the supports. For all general purposes 1in. timber dressed to 13/16in. will be found the most useful, planks 6in. wide being the most handy. except for a large area of sheathing where 12in. planks will require less labour to erect.

The lengths of timber ordered for boxing should, where it can be specified, be of such a size that they can be used to the best advantage with the least waste. Attention to this point may save an appreciable amount of timber if the work is extensive.

Sheathing can be ordered in random lengths as it generally has to be cut up, and short lengths can always be worked in.

Where exact dimensions have to be met joists, studs, posts, beam bottoms, etc., should be ordered to the nearest commercial length to the height or span required. A span of, say, 5ft. 6in. should be ordered in 12ft. lengths for the least waste. Care in specifying the lengths is important; otherwise there will be a lot of short ends and a surprising percentage of waste.

As timber is a costly item in reinforced concrete construction it should be ordered and used with care.

Nails

Common wire-cut steel nails are generally used. Double-headed nails, if they can be obtained, are an advantage, as they can be withdrawn easily.

Wire and Bolts

In vertical sections such as columns and walls a horizontal pressure caused by the hydrostatic head of the wet concrete will act on the shutters. As this pressure is exerted equally in all directions, it can be guarded against by tying the boxing supports with wire or bolts. No. 9 black, annealed wire gives the best service for ordinary work. Steel or galvanised-iron wire should not be used, as it is brittle, hard to handle, and too springy.

Bolts with washers and nuts are used in heavier wall construction. If they are to be drawn after use, they should be well greased or fitted with sleeves.

Become a Successful FARMER —*Learn the Business Side*

If you want to "make a real go" of farming—to run your farm to advantage and profit, get a thorough grasp of the business side. It is so easy to procure this vital knowledge. The Farm Accounting Association has drawn up a special correspondence course designed to provide young farmers with an all-round business training in farm finance, book-keeping and legal matters. Hundreds have found success—why not you? Post the coupon today for full particulars of the course.

The FARM ACCOUNTING Association of N.Z. (Inc.)
C.P.O. BOX 693, DUNEDIN.

The Farm Accounting Association of N.Z. (Inc.),
C.P.O. Box 693, DUNEDIN.

Please send without obligation, Brochure and details of your Home Study Course.

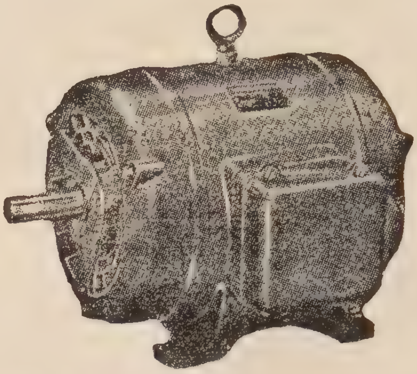
Name ....

Address

SPEEDWAY STERILISER
BURNS OIL OR WOOD
STEAM & BOILING WATER
SS-1-2

Write for free illustrated catalogue to
SPEEDWAY PRODUCTS LTD.
26 Albert St., Auckland
South Island Distributor:
A. H. TURNBULL & CO. LTD.,
Christchurch

TODAY'S MOTOR— *for the N.Z. Farmer*

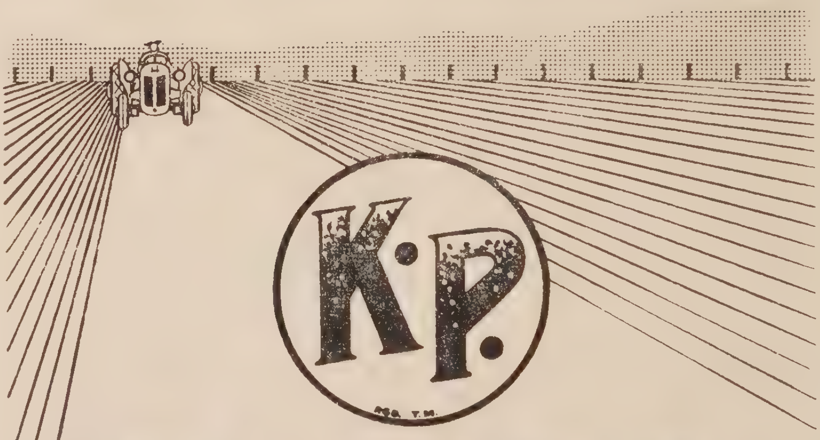


CROMPTON PARKINSON

- Large Diameter Shafts.
- Frame gives Maximum Protection.
- Strong and Compact.
- Balanced Ventilation.

N.Z. Distributors:

A. & T. BURT LTD.



SUPER 44/46

KEMPTHORNE PROSSER & Co's
NEW ZEALAND DRUG COMPANY LIMITED
AUCKLAND — WANGANUI — CHRISTCHURCH — DUNEDIN

Treatment of Shuttering

For work where the concrete is not to be plastered all shuttering coming in contact with the concrete should be well oiled or greased to allow easy stripping and to prevent the concrete adhering to and coming away with the wood. If the concrete is to be plastered, the plaster will adhere better if the surface is roughened; alternatively, a retarding liquid may be used on the shuttering. Special non-staining oil can be obtained for this purpose, though soft soap and water are quite satisfactory.

Loads

The load to be carried by shuttering is the weight of the wet concrete, the shutters themselves, and a live load which allows for impact, wheeling over the shutters, etc., and is therefore a construction load. The weight of the shutters can be neglected, as it is small compared with the other loads.

In casting reinforced slabs such as flat roofs, floors above ground, or beams, calculations of loading on the shuttering may be simplified by taking the weight of concrete as 144lb. per cubic foot. It is then necessary only to multiply the thickness of the floor by 12 to get the weight per square foot, or to multiply the depth of a beam by its width to get the weight per lineal foot. For example, a 5in. slab will weigh 60lb. per square foot, and a beam 10in. wide by 18in. deep will weigh 180lb. per lineal foot. Incline slabs such as may be required as an approach to an elevated floor will cause an overturning movement at the top of the posts supporting the shuttering, and this must be countered by adequate bracing.

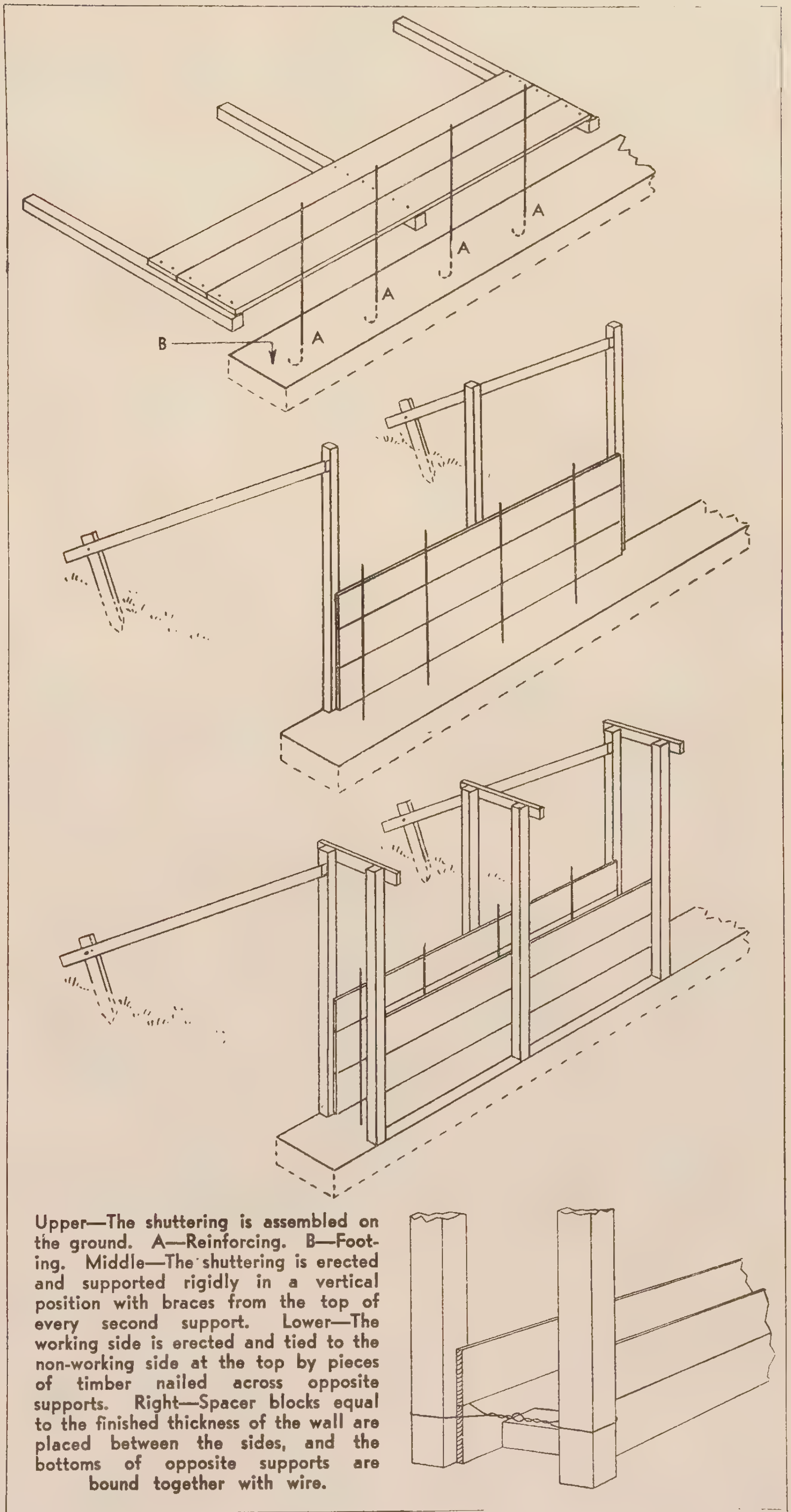
The construction live load is generally taken at 75lb. per square foot, and will exist only during concreting and then for short periods. The piling of material on freshly-poured concrete is dangerous as the shuttering may not have been designed to take the added load. If it is known beforehand that material must be placed on the concrete the day after it is poured, the shutters should be made extra stiff to carry the extra loading with only slight deflection.

Pressure

The horizontal pressure exerted in vertical sections through the hydrostatic head of wet concrete is the pressure which causes most of the bulging and collapse of shutters. The pressure on the shuttering will depend on the rate of filling and the temperature. The faster the shutters are filled and the lower the temperature the greater will be the pressure, because the concrete does not set as quickly and thus relieve the pressure. If a wall were poured so slowly that each layer set before the next layer was poured, by the time the shuttering was full the pressure at the bottom would be no greater than at the top. This is the principle employed with sectional shuttering, which is raised at about the same rate as the concrete sets, so that each layer supports the layer above.

As the outward pressure depends mainly on the rate of pouring, column sides will be under greater pressure than wall sides, because they fill faster. Vertical sections should always

STAGES IN ERECTING SHUTTERING



Upper—The shuttering is assembled on the ground. A—Reinforcing. B—Footing. Middle—The shuttering is erected and supported rigidly in a vertical position with braces from the top of every second support. Lower—The working side is erected and tied to the non-working side at the top by pieces of timber nailed across opposite supports. Right—Spacer blocks equal to the finished thickness of the wall are placed between the sides, and the bottoms of opposite supports are bound together with wire.

be poured as slowly as is consistent with economy and in layers about 12in. thick. Column boxes should never be filled to the top without a break; instead each batch of concrete should be distributed over several columns. Concrete in heavy walls and piers in which large stones or "plums" can be embedded will always exert less pressure on the shutters than when the stones are omitted, because true hydrostatic pressure will not exist.

The consistency of the concrete also affects the pressure, which increases with the increase of the percentage of water in the mix.

Construction of Shuttering

As shuttering is the mould in which the plastic concrete is cast to the shape required the inside of that mould must be the exact profile of the finished concrete. Any roughness or irregularity in the mould will show on the finished concrete.

Shuttering for walls or vertical sections must be set true in relation to the vertical; if one or both sides of a wall are battered, the angle of batter will be relative to the vertical.

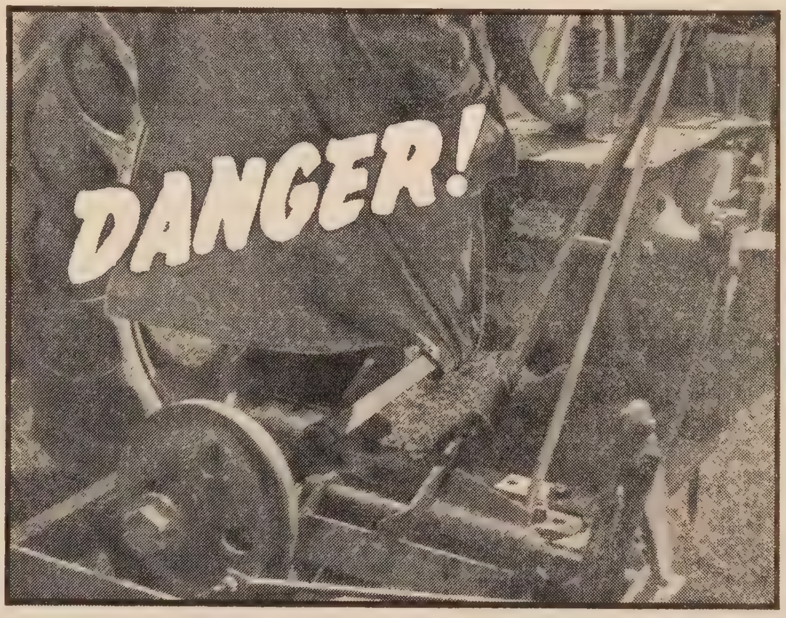
The procedure in erecting shuttering for walls is shown in the diagrams on the preceding page. If the foundations have been dug and footings run with the vertical reinforcing rods cast in (preparation of the foundations and footings for walls will be dealt with in a later article in this series), the shuttering for the walls is built on vertical supports of 4in. by 2in. timbers at least 12in. longer than the finished height of the wall above the footings. Nail the bottom two planks firmly to the supports, placing one at each end and spacing intermediate supports at about 18in. to 2ft. centres, depending on the height of the wall. If the planks are not sufficiently long to span the full length of the wall, the first planks must lap one end support 1in. only to permit other planks to be butted to the same support. Make sure all plank ends are square and nailed squarely to the supports. Erect this section of shuttering on the footings in correct line and position, and support it rigidly in a vertical position with braces from the top of every second support nailed to stakes driven into the ground.

The other side shuttering can now be erected, using the same method and keeping the supports opposite each other. This side does not need any bracing, being tied at the top by a piece of timber nailed across opposite supports. Cut spacer blocks equal to the finished thickness of the wall, and with these between the planks bind the bottom of opposite supports with wire or bolts. The best way to bind with wire is to pass the wire round the supports in a slack loop and, after twisting it well together, to tighten it as a "Spanish windlass" with a 6in. nail or short bar. The spacer blocks are knocked out as the concrete is poured.

When bolts are used spacer blocks are not necessary as ferrules or distance pieces cut from pipe equal in length to the finished width of the wall can be slipped over the bolts inside the shuttering.

When the supports for the full length of the wall have been erected the shuttering for the non-working side can be completed to the top, being finished level to the completed height of the wall. The shuttering planks for the working side can be slipped in as the concrete is being poured, sufficient wire ties being placed as the work progresses to ensure rigidity of the shuttering.

This method of construction, by keeping the top of the work within easy reach, ensures that tamping or spading can be properly carried out as the concrete is placed in relatively short lifts. Bonding between hardened and fresh concrete can also be done more satisfactorily. This applies particularly to narrow walls of 4 to 6in. thickness. The shuttering on the working side should be completed to the level of the shuttering on the non-working side, so that the last pour can be screeded off with a straight-edge and, if necessary, trowelled smooth.



SEVERAL modern machines that are trailer drawn derive their power from the tractor engine through a power take-off shaft. Most implement manufacturers provide shields to cover these shafts, but in many instances drivers neglect to place these shields in position when hitching tractors to the implements. Failure to do so leaves a driver liable to an accident such as this one caught by the camera. The coat tail became caught in the universal joint of the shaft as the driver dismounted from his machine, and a serious accident might have resulted had not prompt action been taken by an assistant to short out the motor.

Never dismount from a tractor without disengaging the power take-off shaft and always cover revolving shafts and axles with the shields provided.

—C. J. CROSBIE, Farm Machinery Instructor, Department of Agriculture, Christchurch.

BOOK REVIEW

"The Fruit, the Seed and the Soil": John Innes Horticultural Institution

GROWERS, gardeners, and seedsmen will welcome the second edition of "The Fruit, the Seed and the Soil," a collection of leaflets prepared by the staff of the John Innes Horticultural Institution, the first edition of which appeared in 1948. The leaflets in the first edition have been revised and brought up to date in the second edition and three more leaflets added. One of these, of interest to nurserymen, is on the raising of plants in blocks of compressed John Innes compost, a method developed during a period when pots were in short supply. The last leaflet describes the colchicine method, which has been effectively used in plant improvement for 10 years and gives answers to some of the questions horticulturists ask most frequently. Nurserymen will find much useful information in the leaflets describing composts and their soil ingredients, and on soil sterilisation. A leaflet on fertility rules in fruit planting gives tables showing incompatible groups of cherries, plums, apples, and pears, and another on the growing of pure seed is of interest to seedsmen. It is a book for all who are interested in horticulture.—*G.A.H.H.*

Macmillan and Company Ltd., London. 3s. 6d.

Household Poultry: Symptoms, Prevention, and Cure of Diseases, Parasites, and Vices

THOUGH the impression that poultry diseases are widespread is common, it is questionable whether, under proper conditions, poultry suffer any more ailments than other livestock. Certainly there is a greater tendency for sick hens to be neglected and for a hopeful attitude that the birds might recover of their own accord to be adopted, but that is the result not so much of wilful cruelty as of a general lack of knowledge. Many simple ailments may be treated profitably. This month's article for the household poultry keeper by W. L. McIver, Poultry Instructor, Department of Agriculture, Hamilton, advises on the symptoms for which to look and emphasises that "prevention is better than cure."

For more complete information than is given in this article the following free bulletins on poultry diseases are available from major offices of the Department of Agriculture:—

Bulletin 264—"Infectious Fowl Paralysis."

Bulletin 318—"Pullorum Disease."

Bulletin 319—"Coccidiosis."

Bulletin 327—"Internal and External Parasites of Poultry."

For diagnosis of poultry ailments, typical ailing birds—preferably two or three live ones—should be sent to the Chief Diagnostic Officer, Animal Research Station, Wallaceville, with a covering letter stating concisely the symptoms recognised and giving a short history of the trouble suspected. No charge will be made for the post-mortem report.

THE incidence of poultry diseases now shows a very encouraging improvement on that of the early part of this century. Even until little more than 10 years ago pullorum disease took its toll unchecked in New Zealand. Now the majority of hatcheries blood test for this disease and kill all the carrier hens, breaking one of the links in the chain of infection. Instead of being the most dreaded complaint among chicks, it now kills very few. The disease is still carried on because of insufficient testing and, ironically enough, because of improved brooder rearing methods, which increase the chances of affected chicks surviving. Such chickens remain carriers and can pass the disease on to their progeny. Unfortunately, most poultry keepers running hens for egg production and not for breeding have the impression that blood testing and tested stock are the concern only of the hatchery owner, but, as affected hens do not lay their full potential of eggs, it is just as important to all hen owners that the disease be wiped out. The pullorum germ affects the ovary and a proportion (averaging about a fifth) of the yolk sacs fail to mature. The hens can show all the visible signs of intensive laying and yet be poor layers or even non-producers. Household poultry keepers should ensure that they buy birds not only from a farm that has blood testing done, but also from a stock with a very low proportion of reactors.

Coccidiosis made heavy inroads in many flocks. The idea that a strict plan of cleanliness and sanitation which involved the removal of litter from brooder houses every few days could aid in its control would not have been accepted without the supporting evidence which research had brought to light.

Thousands of birds were lost annually from "going light" before it was established that this malady was frequently identical with tuberculosis and that infected fowls could be identified by the tuberculin test.

Fowl pox also took its toll. Flock owners accepted with what grace they could the foregone conclusion that they would have fowl pox to contend with each year. Now advantage can be taken of vaccination methods with reasonable assurance that losses from pox will be almost nil.

When the nutritional disturbances to which fowls are susceptible, especially the vitamin deficiencies, were almost unknown, the losses they caused helped to increase the total mortality from unexplained causes. Now everybody has some understanding of dietetics, and poultry feeding is a matter of applying that knowledge with common sense.

This article is not intended to cover all poultry diseases fully, but even the household poultry keeper must have a little knowledge of the subject or he cannot be expected to recognise symptoms.

Pullorum Disease

Pullorum disease can be passed from the hen to her progeny through her eggs at hatching time. The organism causing the disease is located in the hen's ovary and passes with the yolk into hen eggs. Thus, if an infected egg hatches, the chick carries the disease. This complaint used to be called B.W.D (bacillary white diarrhoea) after its major symptom, but it cannot be recognised by outward signs in older pullets or in hens. At that stage of life the disease does not affect body condition or weight, and to the eye the hen looks healthy. It affects chicks, usually under 10 days of age but sometimes up to about 3 weeks.

Affected chickens assume a huddled, sick appearance, with drooping wings, but, as these symptoms apply to nearly all poultry ailments, something more definite must be looked for in diagnosing this complaint. Certain signs are an undue quantity of white droppings and the pasting up of the vent by white droppings.

Coccidiosis

Of the two forms of coccidiosis one affects young chicks and the other maturing birds.

The caecal type shows up mainly between 3 and 6 weeks of age. The distinguishing symptom is an undue amount of red droppings. Dead chicks should be examined for congealed blood in the caeca or blind guts. As the droppings are the most important distributing factor, frequent and thorough cleaning of the brooder pen is the best preventive.

The intestinal type affects mainly birds between 3 and 6 months of age. It does not cause high mortality, but frequently occasions a severe setback in growth and rate of maturity. In a mild form it may make the pullets appear only backward for their age rather than ailing, so it is finally the failure to begin laying at the normal age that makes the average owner realise that there is something wrong with the birds.

This disease should not swell total mortality to any extent now as sulphamezathine has proved an excellent cure of the caecal form, though it is not so effective in the intestinal form.

Tuberculosis

Though tuberculosis probably is the first disease of which most poultry keepers think when making a diagnosis of sick birds, especially if the fowls are emaciated on the breast and keel, it is now far from common in New Zealand and affects very few commercial flocks. There are many causes other than tuberculosis for birds "going light" or wasting.

Again droppings are the greatest source of infection. Control depends on strict sanitary methods and killing of suspected cases.

Fowl Pox

Fowl pox is unknown in the colder areas of New Zealand and occurs so seldom on some commercial farms that the owners do not recognise an outbreak, though other farms experience cases of it year after year. Once the disease breaks out it will run its course.

It is recognisable by the sores it causes on comb, wattles, and face, but as this trouble and roup require special treatment too long to detail here, anyone needing help about them should seek the advice of the nearest Poultry Instructor.

Intestinal Worms

Poultry are very subject to internal parasites. Roundworms are by far the most prevalent, but tapeworm infesta-

LONGER

TROUBLE-FREE

LIFE

when you use

3 - IN ONE OIL

Unlike any other oil of its kind, 3-in-One Oil is actually three oils in one. Instead of just a mineral, vegetable, or animal oil — you get a perfect concentrated blend of all three. That is why 3-in-One Oil does the three big jobs your household oil should do—(1) lubricate, (2) guard against rust, (3) clean away dirt and abrasives. So insist on the truly economical oil — the oil that gives you three oils for the price of one.

PROTECTS ALL THESE

Sewing Machines
Gardening Tools
Bicycles
Sporting Gear
Toys
Perambulators
Baby Pushers
Carpet Sweepers
Hoovers etc.
Door Hinges etc.

It Pays to Get The Best

B-1

3-IN-ONE OIL

Harrison's Handbook

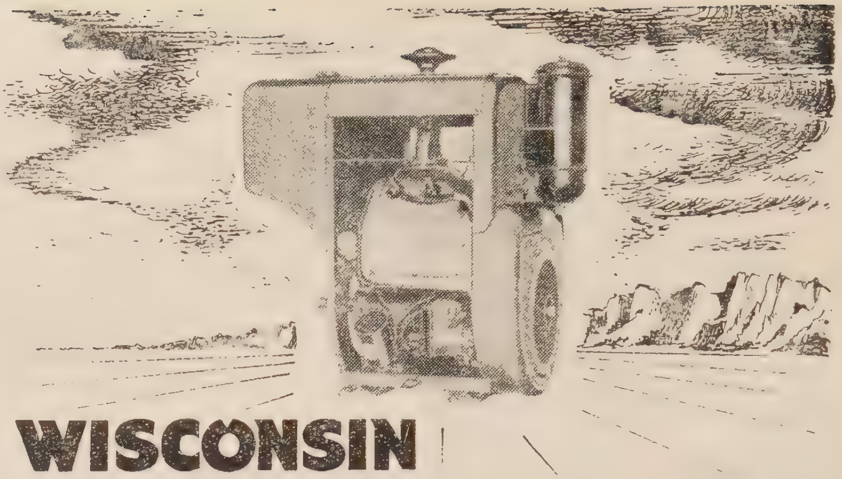
OF HARDY BULBS AND PERENNIALS

Here, in clear, concise form, is what one leading nurseryman describes as "the finest publication that has ever been printed in Australasia."

Harrison's "Hand Book of Hardy Bulbs and Perennials" is written by New Zealand's leading authority on the subject and contains a wealth of information, cultural details and colour plates. Here indeed is what every New Zealand gardener has been wanting. Price only 4s. 6d.

Get your copy from any Bookseller, or if more convenient write Harrison's Nurseries, Box 1, Palmerston North, enclosing stamps or postal note for 4s. 6d. (If 10s. note is forwarded, full change will be returned with Hand Book).

If not completely satisfied you may return Hand Book and have money refunded.



WISCONSIN

. . the power in the land

Farmers need power . . . in remote places they need reliable power, that's why Wisconsin is the choice of the experienced farmer.

The Wisconsin heavy duty engine with its four power packed air-cooled cylinders is suitable for all types of farm use. It is available complete with electric generator and self starter and incorporates many outstanding features.

A full range of parts and accessories are constantly available.

Order early by contacting your nearest office of . . .

DORING IMPLEMENT SUPPLIES LTD

P.O. Box 1179, WELLINGTON. P.O. Box 68, FEILDING. P.O. Box 1203, CHRISTCHURCH. P.O. Box 632, HAMILTON.

Kill Weeds

They're draining your soil, thriving on your fertiliser, cheating your stock, stealing your profits. . . .

Increase Stock

Make two blades grow in place of one . . . put more stock on your land . . . fatten them quicker and enlarge your yield and you'll . . .

Improve Profits

SCIENTIFIC
WEEDONE 57
LO-VOL SPRAY EQUIPMENT

SCIENTIFIC WEED CONTROL FOR PASTURES AND CROPS

You have to fight weeds. The more effectively, the more money you make. Cultivation is a long and costly method—but in WEEDONE 57 and LO-VOL SPRAY EQUIPMENT, science provides an additional answer. WEEDONE 57 is a *selective* killer—deadly to weeds but harmless to grasses and stock. Applied with LO-VOL SPRAY EQUIPMENT it is extremely economical. Its effectiveness has been proved by leading farmers. Get all the facts about your particular requirements. Fill in the coupon below for an *individual* report and the name of your nearest distributor. . . .

IVON WATKINS' WEED CONTROL SERVICE,
P.O. Box 124, New Plymouth.
Send me particulars of WEEDONE 57 and LO-VOL SPRAY EQUIPMENT for the treatment of........................acres infested with..
(complete details give additional information if necessary).
NAME..
ADDRESS..
....IW.1

Specialised information without cost or obligation.

IVON WATKINS LIMITED, BOX 124, NEW PLYMOUTH.

tion is not uncommon. It is frequently stated that a few roundworms do no harm to the hen and that the small caecal worms have no ill effects, but scientific ideas on these worms are now changing and all poultry keepers are strongly advised to keep their stock, especially growing pullets, clear of these parasites. The earlier method of deworming was to put nicotine sulphate in the wet mash at the correct dosage rate and to hope that each bird would eat sufficient, but birds dislike it to such an extent that they will eat some of the medicated mash only after being starved. Even then few of the birds will eat enough.

The correct treatment is by individual dosage and, though some flock owners contend that they have not the time to do this, it can be carried out very simply and quickly by either of two methods. The first is by injecting liquid carbon tetrachloride into the bird's crop with a special type of drenching gun. With experience and the help of three people to catch the birds the operator can dose 200 in 20 minutes. The second is by giving the carbon tetrachloride in pill form, which is easy but takes longer than using the deworming gun.

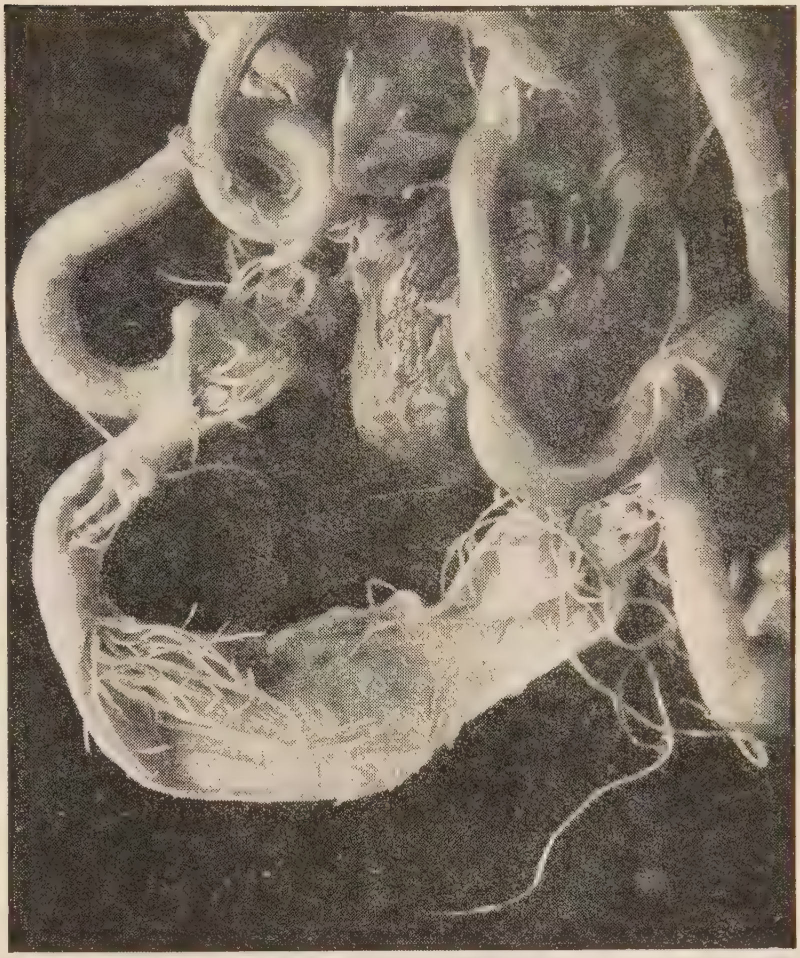
It is most important that growing pullets be prevented from becoming even moderately infested with worms, which affect the bird's appetite, rate of growth, maturity, and egg laying. Whether or not young pullets are suspected of being infested, they should be dewormed at 3 months of age and again at 4½ to 5 months.

In the past poultry keepers were always advised to take great care after dosing to clean up the expelled worms and worm eggs, but now it is felt that serious reinfestation usually is prevented by the development of immunity as the birds increase in age. In many cases a second deworming is easier than making a thorough clean-out.

Vitamin A Deficiency

Many poultry ailments are aggravated and even encouraged by the bodily condition of birds being weakened by worms. Another predisposing factor not considered or properly appreciated by many is lack of certain vitamins, of which vitamin A is important. What used to be called nutritional roup is now known to be not roup at all but vitamin A deficiency.

Lack of vitamin A, infestation with worms, or both weakens young stock to such an extent that intestinal coccidiosis is likely to develop in cases in which otherwise it would cause little or no trouble. Vitamin A deficiency can be guarded against by ensuring that growing chicks receive adequate amounts of good-quality greenfeed. If doubt exists about the vitamin A content of the greens, or if growing stock are not getting sufficient direct sunshine, the feed should be supplemented with 1 per cent. by weight (based on the total daily food intake) of a reliable brand of fish-liver oil placed in the mash or chick grain. Routine dosing for worms should also be carried out.



The intestine of a fowl cut open to show a heavy infestation of roundworms, the most prevalent of internal parasites of poultry.

External Parasites

Most poultry keepers can at least recognise lice and mites. A bad infestation of these parasites can eventuate only under poor management conditions. They are easy to keep under control if their habits and life cycle are understood. Control methods depend on the principle that mites live and hibernate in the poultry house, starting at the roosts, and the body louse passes its whole existence on the fowl. The mite gets on to the fowl on the perch at night and leaves it before daylight, but the louse never quits the bird except accidentally.

The cheapest methods of counteracting mites are by painting with a brush or spraying with a pump all interior woodwork with creosote, tar distillate, old car sump oil, kerosene, or a combination of them. Special care must be taken to ensure that the liquid seeps well into cracks and spaces between overlaying pieces of timber, especially about the perches and nests. The house should be permitted to dry out reasonably before the birds are placed in it, as they can be upset by fumes, particularly if they are in lay. If the henhouse is thoroughly treated and cleaned once yearly and the perch and nest areas are painted or sprayed at 3-monthly intervals, mite infestation will be prevented.

As little timber bracing as possible should be used when perches are made and wood should not be nailed to wood, as the cracks make an ideal hide-out for mites. Perches can be rested on two cross-bars suspended by wires from the rafters, and even then they need not be nailed to the bars but can be slotted between projecting nails. A space of at least 3in. should be left between perches and side walls.

Body lice live entirely on the skin of fowls. They are found mostly on the abdominal portion of the bird, as they prefer the loose, fluffy feathers between the vent and the keelbone. These parasites lay their eggs at the bases of the feathers around and under the vent and also, in cases of very heavy infestation, under the wings. Control is best achieved by direct application to the skin of 40 per cent.

GROW PEAS on Contract

Plan now for next season's area and be certain of obtaining the highest prices with no risk of markets. Some peas may be difficult to sell but by contracting with Yates you can be certain of price and disposal. Grow Peas that suit your land —our experts will advise the right variety. Sow seed produced by a New Zealand Seed Firm for New Zealand Conditions—maximum yields. Highest prices and an assured market; no gamble — prompt payout.

ALL GARDEN TYPES AVAILABLE

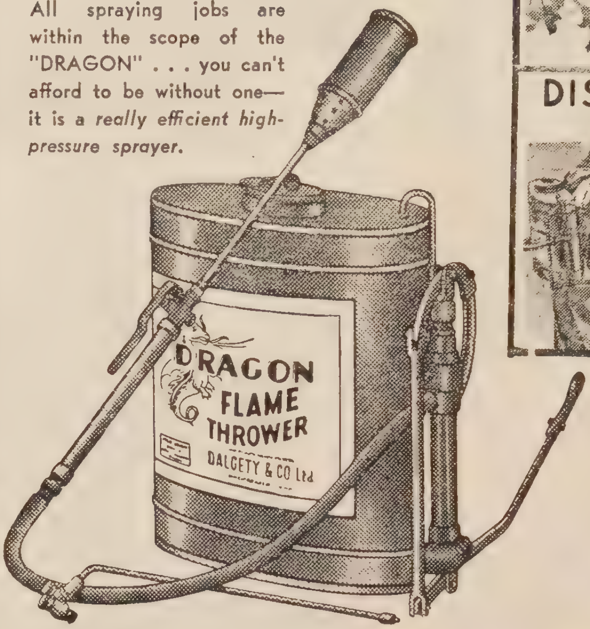
ARTHUR YATES
& Co. Ltd.
AUCKLAND and
CHRISTCHURCH

See your nearest representative early—

AUCKLAND: Head Office. Box 1109.
GISBORNE: Common Shelton & Co., Ltd.
HASTINGS: Turners (H.B.) Ltd.
BLENHEIM: A. Yates & Co. Ltd., Branch Office.
CHRISTCHURCH: A. Yates & Co. Ltd., Manchester Street.
OTAGO: Chas. E. Wallington, Omakau (phone 6K); alternative address: 19 Granville Terrace, Belle Knows, Dunedin. Phone 21-746.
SOUTHLAND & WAKATIPU: D. W. Thompson, Queenstown, Box 91. Tel. 42M.

The Ideal multi-purpose SPRAYER . . .

All spraying jobs are within the scope of the "DRAGON" . . . you can't afford to be without one—it is a *really efficient high-pressure sprayer.*



SPRAYING

DISINFECTING

Enquire from

DALGETY and CO. LTD.
(INC. IN ENG.)

Branches throughout New Zealand

Prevent that check at weaning with

TOMOANA

Calf Pellets

NO CHECK AT WEANING is the rule where calves are being fed on TOMOANA CALF PELLETS.

Containing linseed meal, fish meal, meat meal and selected cereal meals, TOMOANA CALF PELLETS can be fed dry, and in this way the calf's digestive organs become more easily accustomed to solids.

The effect of weaning is cushioned by the concentrated food of TOMOANA CALF PELLETS, so that the calves will grow steadily and without check into robust and sturdy yearlings.

For further information write to:— Nutrition Advisory Department,
W. & R. FLETCHER (N.Z.) LTD. BOX 663 WELLINGTON

nicotine sulphate—three or four drops below the vent, one under each wing, one on each side of the breast, and another on the top of the neck behind the head. This treatment should be repeated two or three times at weekly intervals to kill newly-hatched lice eggs and the birds carefully examined periodically to see that they are free of lice.

Future treatments, provided infestation is light and newly-laid lice eggs are not present, can be applied to the perches instead of to the birds. The procedure is to clean the perches of organic matter during the day and, about 20 minutes before perching time, wet the tops of the perches with a rag and warm, soapy water, then put drops of nicotine sulphate about 1½in. apart on them. The rising fumes will kill most of the body lice.

Flowers of sulphur dusted into the feathers and on to the skin is also effective. This treatment should be repeated in about 8 days. The sulphur may be added to the dust bath as a preventive.

Scaly Legs

Not really a disease, and certainly not a sign of age, scaly leg is a condition caused by a mite to be found under the scales on the legs of a fowl and on the perches. Treatment is by frequent applications, until a cure is effected, of lard, sulphur, and kerosene after the shanks have first been soaked in warm, soapy water. The kerosene must not be allowed to get on to the skin. Even better than kerosene is diesel engine oil or crude petroleum applied on its own either with a brush or by dipping the shanks into a container of oil. The bird may be released after treatment, which should be done early enough in the day to allow the oil to dry. In other than severe cases two applications are sufficient.

The heavy-breed varieties are far more prone to scaly leg than light breeds, which seldom get the trouble unless they are reared naturally from chickenhood under a heavy-breed broody hen or are housed for sufficiently long with heavy breeds. These factors supply another answer to the question of how to clean up the trouble if the cures mentioned are considered to involve too much bother: At the end of the laying year quit all the birds—even those apparently unaffected—and thoroughly clean out and spray the house with creosote or one of the other materials recommended; then replace the stock with pullets, preferably of a light-breed strain (even if only for one year, after which heavy breeds can be reverted to) that have been reared artificially.

Corns and Bumble-foot

As a rule corns cause little major discomfort to fowls, but when the corn festers and turns into an abscess the whole foot swells. The swelling comes up between the toes and affects the joints. Finally, the bird limps around in obvious pain. This condition of bumble-foot can be operated on, but, though tedious trouble may be taken, not many permanent cures will be effected.

A pullet acutely infected with coccidiosis and unable to stand upright because of general debility.

The causes are usually stated as inadequate, loose, and unsuitable litter on the floor, jumping off too high perches and projections, and prickles. These factors aggravate the incidence and should be remedied, but heredity seems to play a major part in this trouble.

Protrusion of the Oviduct

Though not a disease, protrusion of the oviduct could be classed as one in cases where the family strain has a hereditary disposition to it. Protrusion is commonly said to be the result of overstrain when laying a large egg, but probably a constitutional weakness of the oviduct is the more frequent cause. In that case attempting a cure is obviously a waste of time, as the condition is certain to recur. In any case, there is a grave danger that it will lead to the vice of vent picking.

Vices

Birds, being creatures of habit, rapidly learn not only good habits but vices. Once well established vices are very hard to stop. A very watchful eye must be kept on young chicks for toe picking because it can develop rapidly into cannibalism. Affected chicks should have the picked parts covered with stockholm tar or creosote and be removed temporarily from the brooder pen. Any chicks seen going round wilfully picking at the others should be segregated for a while. Many cases of this trouble are the results of overcrowding or letting the chicks go too long without food. Sometimes the habit is caused by the litter not being sufficiently deep and loose for the feet to sink in. Another cause is a small patch of sunshine showing up the colour in the toes of the few chicks in that area. Chickens should be fed little and often and kept busy, especially with their greens and root vegetables.

An even worse vice when it gets a hold is vent picking. The bad stage is at maturity, when some pullets have begun to lay and some have not. Many farmers have their "cures" for this complaint, but unfortunately no universal remedy can be given. It seems certain that the root of the trouble is a mineral deficiency in the diet, but the trace elements involved are present in such small quantities that no one mineral can be named in each special case. Outside runs, ample accommodation, adequate greens, darkened nests, increased salt in the mash, and a larger ration of meat meal all help on occasions to stop the vice, but more often than not the cannibal culprits have to be found by observation and isolated temporarily.

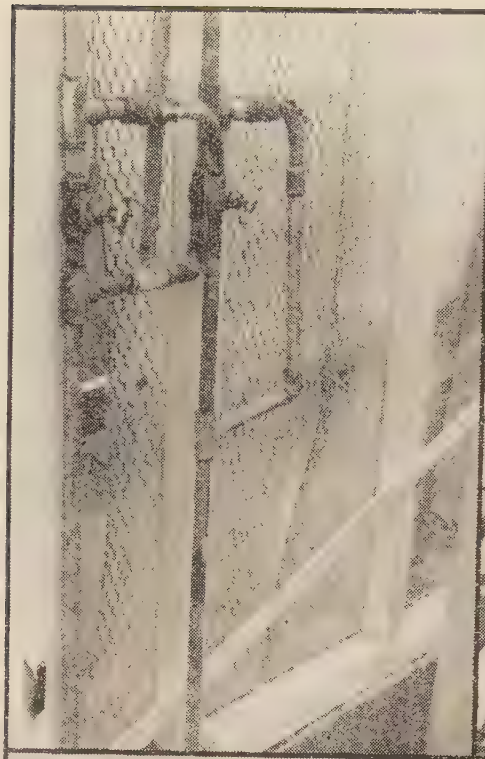
Protrusion of the vent and vent picking must be carefully distinguished. Many deaths are blamed wrongly on protrusion. Once birds acquire a taste for intestines they soon go around looking for more.

Preventive Measures

Only short descriptions of poultry ailments have been given, but it should be appreciated that preventing such troubles is better than trying to cure them. A general idea of the ailments and vices to be expected and a general knowledge of what is most likely to prevent a severe outbreak should be the aim of the household poultry keeper.

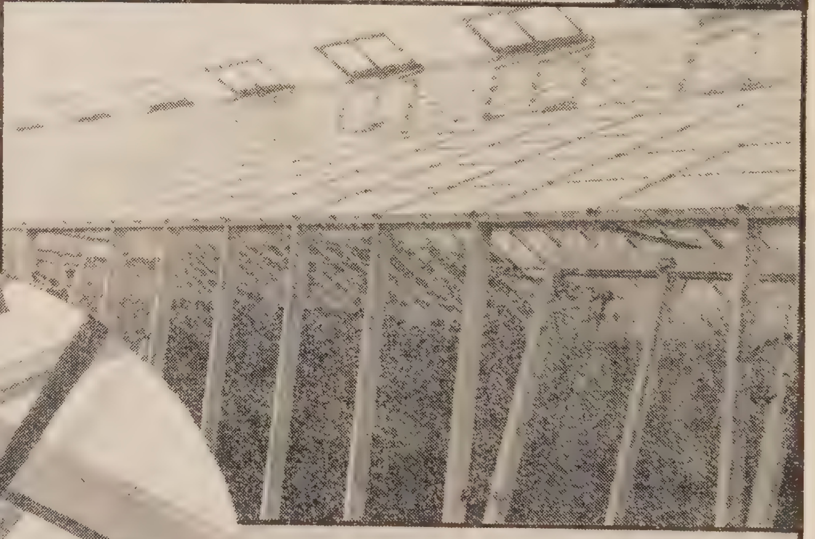
Well-built, adequate accommodation with proper equipment, thorough cleanliness, and a good diet with sufficient greenfeed and sunshine or fish-liver oils are important factors, which can be backed up by purchasing blood-tested stock from a reliable source and maintaining the birds free from worms, mites, and lice.

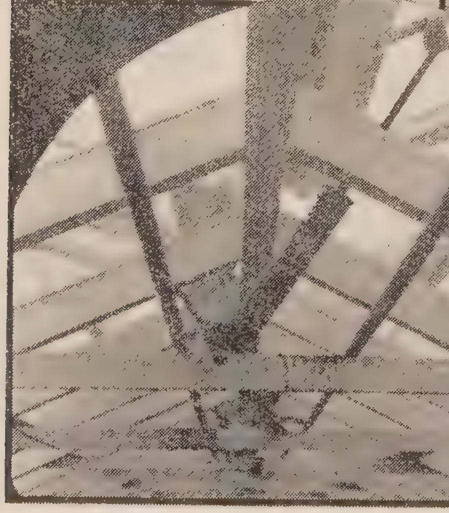
CONSTRUCTION DETAILS OF HYDRAULICALLY-OPERATED GLASSHOUSE VENTILATORS



Above—The control system. On the left is the pipeline from the water main; the 2 lower taps operate the opening of the ventilators and the 2 top taps, which connect with the overflow pipe shown at the right, control the closing of the ventilators. The centre pipeline at the top of the photograph leads to the overhead water pipe, which has taps at intervals, shown in the illustration on the opposite page.

Above—A type of mechanical ventilator-opening equipment, which is shown for comparison with the hydraulically-operated ventilator system.





At left—A hydraulic cylinder, showing the steel strut to which it is attached at the base and the hose which connects the pipeline to the cylinder chamber. The ventilator is fully opened. Above—Side view of the glasshouse, showing how the top ventilators are connected at the base.

HYDRAULICALLY-OPERATED GLASSHOUSE VENTILATORS

By J. A. CEDERMAN, Orchard Instructor,
Department of Agriculture, Kaikohe.

SEVERAL types of equipment are used in glasshouses to operate the opening and closing of ventilator systems: They range from single levers fitted to individual ventilators to more complicated mechanical gear capable of operating entire ventilator systems of large glasshouses. The latter type is often difficult to operate, costly to install and maintain, subject to mechanical breakdown, causes unnecessary shading, and takes up a significant part of a busy grower's time each day. A hydraulic system fitted and operating successfully in a large glasshouse at Otaki, which is described in this article, appears to have much to commend it.

THE hydraulic equipment was made and installed by the patentee, a registered plumber of Otaki. The equipment, which is fitted in a glasshouse 100ft. long by 30ft. wide, operates the opening and closing of 27 large ventilators alternating along the top ridge of the house.

The working of the ventilators is controlled from 4 water taps fitted at one end of the house. Two taps are connected to a ¾in. pipeline from the water main and operate the opening of the vents on their respective sides of the house. Two further taps, connected to an overflow pipe, control the closing of the vents. Above the control system each pipeline is reduced to a ½in. copper pipe extending the length of the house.

The base of the small hydraulic cylinder is connected by a small piece of steel to a 2in. steel strut bolted between the rafters under each ventilator. The top of the cylinder or cylinder rod, which operates the lifting or lowering of the ventilators, is attached to the higher portion of the centre board of each ventilator about 6in. from the ridge blade of the house. A 6in. length of ½in. high-pressure hose connects the copper pipeline to the base of each cylinder. The cylinders, which are copper with brass pistons, have floating rubber washers the same size as the chambers at the base of pistons.

The only unusual feature about the ventilators is that they are connected at their base by a piece of 2in. x 1in. timber. This facilitates even opening and closing.

How System Operates

A water pressure of from 15 to 30lb. to the square inch is required to operate the system. The turning on of a tap at the end of the house forces water from the pipeline through the connecting hose into the cylinder chamber, the cylinder rod is forced up, and the ventilators are opened simultaneously to the desired height. The turning on of a second tap releases the water within the cylinder, which passes to an over-flow sump and the ventilators are partially or completely closed as desired. Two identical taps operate each side of the system.

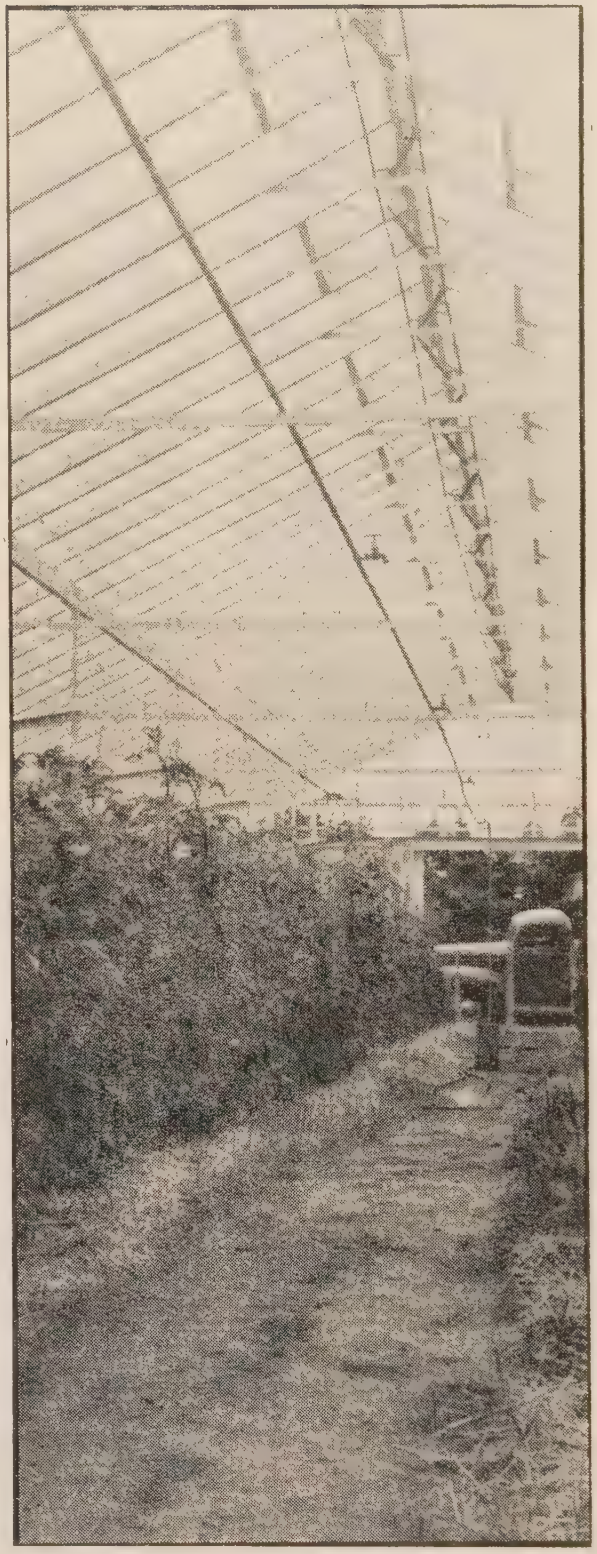
The movement of the ventilators is instantaneous with the turning on of the taps; when tested the ventilators moved from closed to fully open in from 10 to 12 seconds and required from 5 to 6 seconds to close.

At present the equipment is fitted to the top ventilators only, but the designer can see no reason why the side ventilators could not be operated also. It is considered that a complete glasshouse unit of several houses could be connected and operated from one set of control taps, as each cylinder operates individually and the overall load is not increased by an increase in the number of ventilators.

The cost of the equipment, though fairly high at present, may be reduced considerably if cylinders are manufactured in large numbers. Maintenance costs should be negligible, as there is no strain on the working parts and the equipment is all rust-proof.

With a hydraulic system any number of ventilators can be operated speedily and simply. This should ensure better control of humidity and temperatures within glasshouses and a corresponding improvement in plant growth and disease control. There is no strain on the house structure as is imposed by the operation of mechanical equipment. The reduction in maintenance costs and the daily saving of labour are also appreciable.

The water pressure in any normal water supply system is sufficient to operate the hydraulic system.



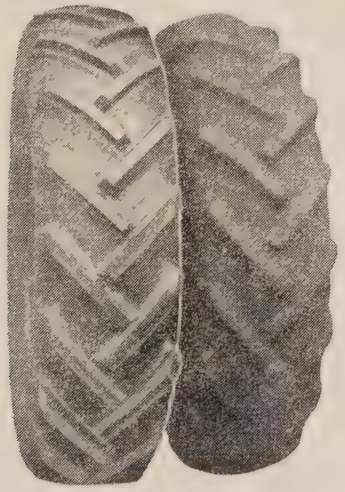
The ventilators fully opened.

KEEP THE WHEELS TURNING

Speed Railway Wagons Speed Production

In its response to the demands for still more produce, industry places a heavier load upon the Railways. Rapid transport is vitally necessary in order that the Dominion's domestic needs may be met and that the Mother Country also shall have the fullest benefit from our drive for increased production. Help maintain the drive by quickly releasing railway wagons and tarpaulins. They are required elsewhere. Delay in unloading impedes the national effort.

Collect Consignments Quickly



TRACTOR OWNERS

Don't waste power, fuel and time, have your tractor tyres re-lugged and made equal to new, by latest American plant. All work guaranteed. Twelve months' operations have proved the efficiency of re-lugging by specialists—at half the cost of new tyres. . . . Think of the saving. Contact your nearest garage for service or direct to Factory.

INDUSTRIAL GROUND GRIP LTD.,
Hornby, Christchurch.

HOW WILL IT OPEN UP?

Ask your Produce Merchant for

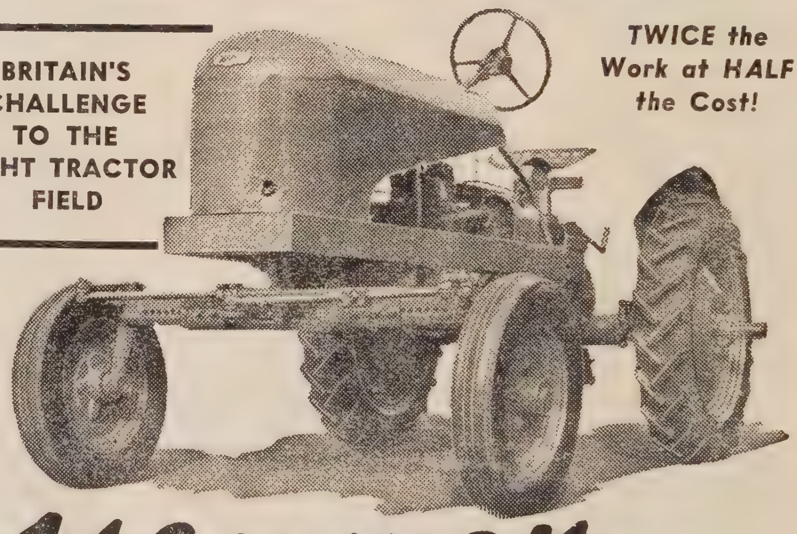
You can enrich your hay and make sure it opens up next season in first-class condition by using TOMOANA HAYSTACK MIXTURE. TOMOANA HAYSTACK MIXTURE is a molasses-salt-mineral mixture, specially made as a crumbly meal for easy handling of the molasses. It is simply thrown on, layer by layer, as the stack is built. The mixture works in two ways. Not only does it give a good "cure" to the whole bulk of the hay, but it also forms part of the molasses diet in winter when hay is normally fed out.

TOMOANA HAYSTACK MIXTURE

For further information write to W. & R. FLETCHER (N.Z.) LTD., Box 663, Wellington.

BRITAIN'S CHALLENGE TO THE LIGHT TRACTOR FIELD

TWICE the Work at HALF the Cost!



Newman

(Petrol or Diesel)

BRITISH LIGHTWEIGHT TRACTOR

AUTHORISED NEWMAN DISTRIBUTORS.

AUCKLAND: Farmers' Trading Co. Ltd. DARGAVILLE: Pinkers Garage Ltd. WHANGAREI: Paine Bros. (North Auckland) Ltd. KAIKOHE: Paine Bros. (Kaikohe) Ltd. THAMES: W. Judd, Pollen St. MORRINSVILLE: Burmester & Armstrong Ltd. ROTORUA: T. D. Webster & Co. TAURANGA: Robbins Machinery Co. Ltd. FRANKTON: Browns Machinery. NEW PLYMOUTH, STRATFORD, HAWERA: L. H. Johnson Motors. HASTINGS: Turners (Hawke's Bay) Ltd. CHRISTCHURCH and RANGIORA: Skillings Implements Ltd. DUNEDIN. Reilly's Central Parking Station Ltd. OAMARU: Swinard Bros. Ltd. INVERCARGILL: Gormack, Wilkes, Davidson Ltd. DANNEVIRKE: Dannevirke Machinery Exchange. GISBORNE: Farm Implement Supplies. WANGANUI: Linwood Motors Ltd.

Home-made Potato Bagger

By A. J. EBERT, Assistant Fields Instructor, Department of Agriculture, Christchurch.

BECAUSE of the acute shortage of labour for picking potatoes last season, many more farmers will be considering attaching bagging machines to their diggers for lifting next season's crop. The mechanical digger-baggers which can be purchased are expensive for a farmer who is growing only about 20 acres of potatoes and, unless a considerable amount of contract work is offering, a grower who does not produce on a large scale will find that buying a machine ties up too much money. The high prices of manufactured digger-baggers have induced some farmers to build their own baggers, and this article describes how one farmer designed and built suitable equipment.

Digger and bagger viewed from the tractor.

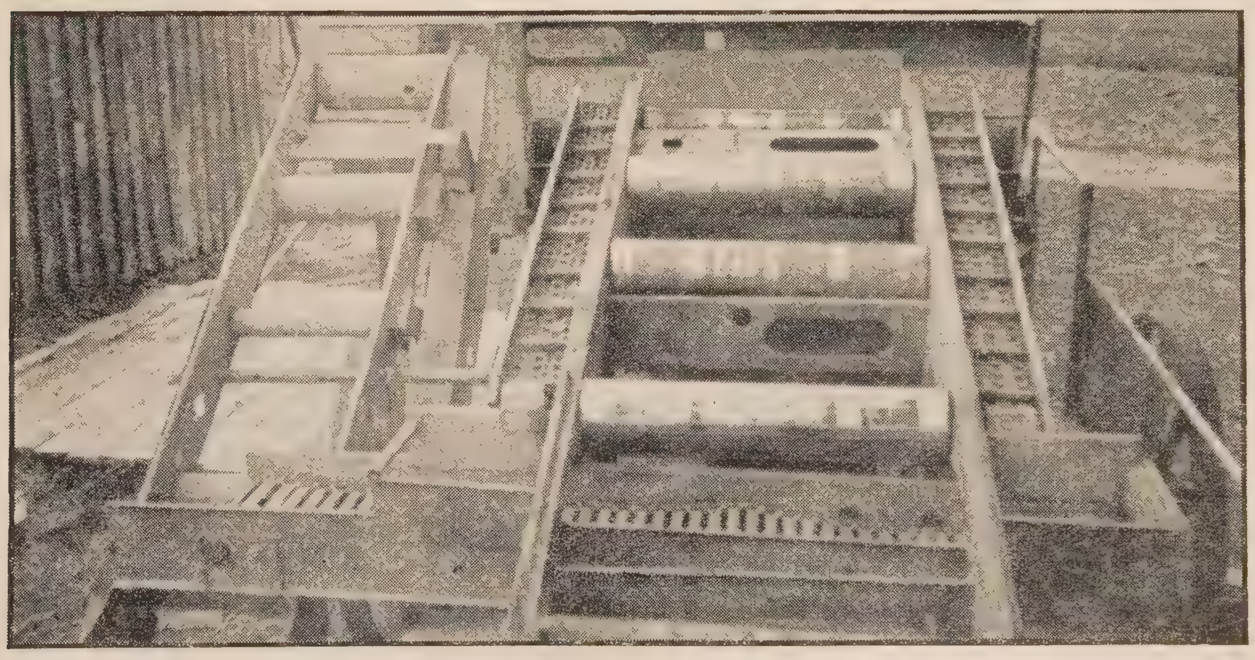
IN designing and building a bagger many problems have to be overcome. The varying soil conditions under which the machine has to operate and the varying amounts of stones, weeds, and haulms with which it has to cope must be taken into account; whether table and seed potatoes are to go in together or table potatoes are to be picked off on the machine must also be considered. A Hororata farmer, Mr. W. Oakley, has built himself a machine which seems to have overcome most of the problems mentioned. It is a bagger on which the table potatoes are picked out from the seed on the machine.

Construction and Operation

Potatoes are dug by a digger which has had the back apron raised so that it feeds on to the bagger. The latter has one main canvas elevator about 3ft. wide, which carries everything that comes off the digger. Three men stand each side of this conveyer; the first pair (on opposite sides of the conveyer) pick off the table potatoes and put them on to a conveyer belt which runs across and under the main canvas elevator to an elevator on one side which leads to the back of the machine where the potatoes are bagged. The 2 men also pick off the bigger weeds and haulms. This leaves clods, stones, some weeds, and all potatoes under table size on the main elevator. The seed potatoes are picked off by the next 2 men (one on either side of the elevator) and put into 2 small elevators which run up alongside the main elevator and thence to the bags. The material remaining on the canvas is returned to the ground.

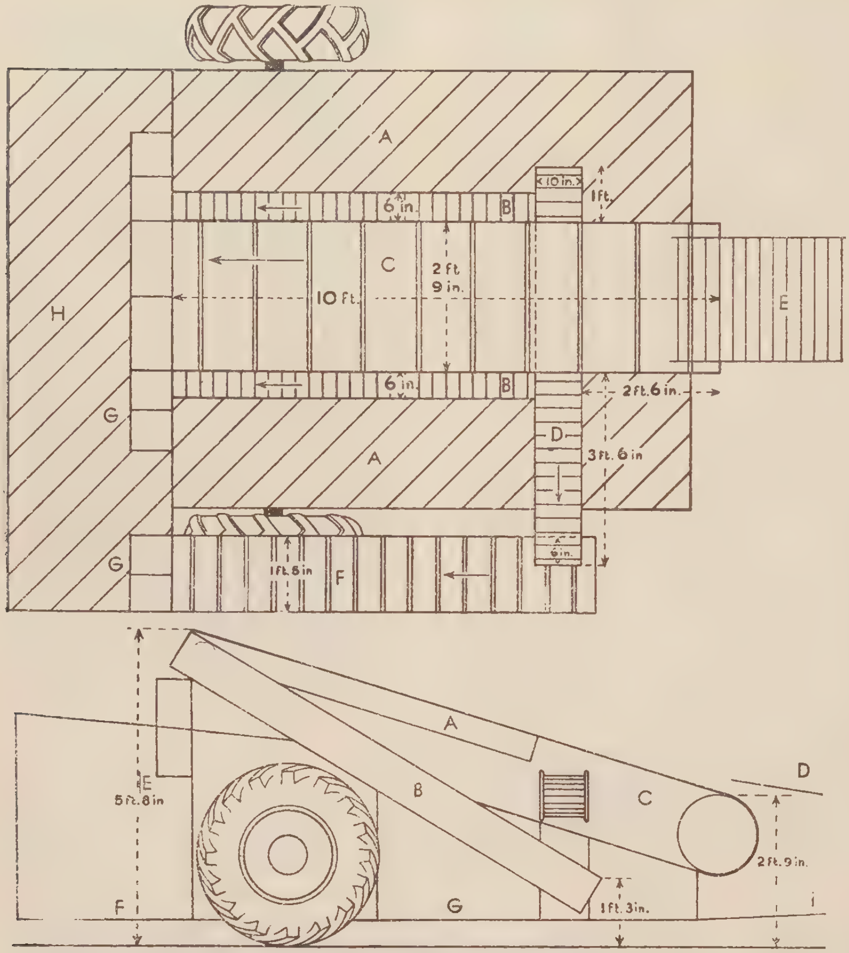
The remaining 2 operators stand on the bagging platform, running across the rear of the machine, on which there is ample room for them to handle the bags from the 3 bag holes —1 for table potatoes and 2 for seed.

Table potatoes are picked off first, as this eliminates further handling and the possibility of damage. On this farm, which produces Certified seed, all the seed is picked off and graded later into the respective sizes of under-



The bagger without elevator canvases. The main elevator is in the centre of the illustration and the seed-potato elevators are on either side of it. At left is the elevator for table potatoes and in the foreground is the conveyer which carries table potatoes under the main elevator.

HOME-MADE POTATO BAGGER



Above—Construction details of home-made potato bagger. A—Platforms. B—Seed-potato elevators. C—Main elevator. D—Table-potato conveyer. E—Digger apron. F—Table-potato elevator. G—Bag holes. H—Bagging platform. In the diagram the bagger is shown with pneumatic-tyred wheels, though the machine described has iron wheels. Pneumatic tyres are an advantage, particularly on soft ground. Below—Side view of bagger. A—Seed-potato elevator. B—Table-potato elevator. C—Main elevator. D.—Digger apron. E—Bag holes. F—Bagging platform. G—Platform. H—Draw-bar.

grade, 2-4oz., and 4-6oz. The last size is picked out only if there is a demand for large-size seed; otherwise tubers within this range are taken off as table potatoes.

The digger is driven from the power take-off of the tractor, but the drive for the bagger is taken off one of its own wheels so that the whole outfit is under the control of the tractor driver.

Materials Used

The chassis of the bagger is made from an old truck and all the framework of steel sheets that were formerly parts of old petrol pumps. The elevators, other than the canvas one, are made from chains fitted at intervals with wooden cross-pieces, which carry the potatoes to their respective sacks.

Few Hold-ups

As there is a minimum of working parts, there are few hold-ups caused by breakages, which would be serious, as 8 men would be idle until repairs could be effected.

Though a large number of men is required to operate the bagger, it is not difficult to get the assistance of neighbouring farmers, who, though they may not be prepared for the onerous job of picking up potatoes off the ground, are willing to work on the bagger and by thus co-operating get their own potatoes dug.

In England various digging and bagging combinations are being tried, with varying degrees of success. They aim at cutting to a minimum the man-power required for harvesting and even have devices such as automatic stone removers; but they do not separate the potatoes into seed and table grades and that work must be done later. A machine similar to that built by Mr. Oakley, which will dig about 30 tons a day, could be built by other growers who have sufficient mechanical knowledge and who do not wish to rely on potato pickers.

SHOW DATES

THE following are dates and venues of A. and P. shows for January and part of February.

January 2—Nuhaka A. and P. at Nuhaka.

*January 13 and 14—Wairoa County A. and P. at Wairoa.

January 14—Waikouaiti A. and P. at Waikouaiti.

*January 21—Tauranga A. and P. at Tauranga.

January 21—Marton District A. and P. at Marton.

January 21—Central Hawkes Bay A. and P. at Waipukurau.

January 27 and 28—Horowhenua A. and P. at Levin.

January 27 and 28—Taumarunui and District A. and P. at Taumarunui.

January 28—Waiau A. and P. at Tuatapere.

January 28—Helensville A. and P. at Helensville.

*January 31 and February 1—Feilding I. A. and P. at Feilding.

February 4—Golden Bay A. and P. at Takaka.

February 4—Palmerston and Waihemo A. and P. at Palmerston.

February 4—Rodney Agricultural Society at Warkworth.

*February 4—Woodville A. and P. at Woodville.

February 4—Clevedon A. and P. at Clevedon.

*February 7 and 8—Dannevirke District A. and P. at Dannevirke.

February 10 and 11—Rangitikei A. and P. at Taihape.

February 10 and 11—Taranaki A. and P. at New Plymouth.

February 11—Murchison A. and P. at Murchison.

February 11—Waitemata A. and P. at Waiwera.

February 11—Hukerenui A. and P. at Hukerenui.

February 11—Katikati A. and P. at Katikati.

*February 11—Pahiatua A. and P. at Pahiatua.

February 11—North Kaipara Agricultural Association at Paparoa.

February 15 and 16—Ohura A. P. H. and I. at Nihoniho.

February 16—Christchurch Stud Ram Fair at Christchurch.

February 16 and 17—Christchurch Flock Ram Fair at Christchurch.

February 17 and 18—Franklin A. and P. at Pukekohe.

February 17 and 18—Masterton A. and P. at Masterton.

February 18—Northern Wairoa A. and P. at Mititai.

February 18—Te Puke A. and P. at Te Puke.

February 22—Te Awamutu A. and P. at Te Awamutu.

February 22—Opotiki A. and P. at Opotiki.

February 25—Putaruru A. and P. at Putaruru.

* The Department of Agriculture exhibit will be staged at this show.

Patents for Inventions Connected with Farming Activities

By F. C. KORRICK, Patent Examiner for Primary Industry,
Patent Office, Wellington.

WHEN in 1831 Cyrus Hall McCormick, village blacksmith and farmer, built his first mechanical reaper he started the farming industry on the road to mechanisation. McCormick was fortunate in that the United States Patent Office granted him a patent for his invention and thereby virtually gave him the sole right "to make, use, exercise and vend" his reaper for a set number of years without fear of competition. Thus when in 1847 the McCormick factory was started in Chicago his harvesting machines had a good start, especially as the protection afforded by the patent office had enabled the inventor to try his machine openly under varying conditions and in distant parts of the country, correct weaknesses, and, most important, create a reputation among the farming community. Under New Zealand patent law the King will grant an inventor monopoly rights for a term of 16 years, on expiry of which the invention becomes public property, that is, anybody is then entitled to make, use, exercise, or vend it without having to ask the inventor's permission.

TO enable the public, after the monopoly has expired, to build the machine, apply the method, or employ the process according to the invention, the inventor is required to deposit with the Patent Office a full description and, if necessary, drawings of his invention. This Complete Specification will be kept at the Patent Office library, where it may be inspected. Abridgments of all such accepted specifications are also published, together with drawings (if any) every month in the Patent Office Journal, which is exchanged with similar publications of the principal patent offices throughout the world. For this reason any patent office library is a veritable storehouse of human knowledge.

Patent Fees

In New Zealand (unlike some countries) it costs little to apply for a patent, nor are the fees charged to keep the patent alive for its full term prohibitive. An inventor may file either a Provisional Specification or a Complete Specification in the first instance. Either must be accompanied by an application form, incorporating a statement of address for service. The inventor can draw up the specifications himself, or, as is done in most cases, he may avail himself of the help of a registered patent agent. A fee of £1 must accompany a Provisional Specification and a fee of £2 a Complete Specification. The former will afford provisional protection to the applicant for 12 months from the date of lodgment with the Patent Office; this means that the applicant is free now, without invalidating his priority right, openly to make, use, exhibit, improve, or otherwise deal with his invention. Even assignment or sale of the prospective patent rights, if and when granted, are possible. Unless, however, the Provisional Specification is followed within 12 months by a Complete Specification (which, as pointed out before, could alternatively have been filed in the first instance), the application is deemed to have been abandoned. If, on the other hand, a Complete Specification has been filed, it will be examined thoroughly by the Patent Office in the light of the requirements of the Patent Act and, if accepted, details of it will be published in abridged form in the Patent Office Journal. If no opposition is raised within 2 months, the Letters Patent will be issued on payment of a fee of £1. Small renewal fees will also fall due at intervals during the term of the patent. Forms, information leaflet, list of patent agents, and sample specification are supplied free by the Patent Office to anyone interested.

Today every step in life is governed by patents. Human progress is based on inventions and the very standard of living of whole nations is dependent—to quote an American authority—"on the inventive genius of its population and the type of patent legislation which makes good use of it."

Reliance on Individuals

Unlike the engineering industry and the fields of electronics or chemistry, where improvements or developmental work are carried out in well-equipped laboratories by paid researchers, primary industry in general and farming in particular have to rely on the individual inventor—the man on the land, in the butter factory, or in the meat works, in other words on those who are in closest touch with the day-to-day problems confronting them in their work and who, through ceaseless struggle and effort or a sudden flash of genius, find solutions for them. Such inventions, if guided into and through the proper channels, may mean not only an easier life for the many who will be able to use the improvement but a financial reward for the inventor. It is in this way that new devices originated for tailing lambs, improving milking machines or shed routine (non-stoop sheds), or novel arrangements for drainage or ditch clearing, livestock dipping, seed sowing and fertilising, and eradicating noxious plants and animals were developed.

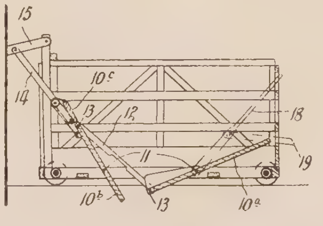
Room for Improvements

There is, and always will be, room for improvements: At present inventors are concerned with apparatus and methods for aerial seed sowing and fertilising, with crop dusting and

RECENT PATENTS

The following particulars of recent patent applications of interest to farmers have been selected from the Patent Office Journal, September, 1949, issue and are published by permission of the Commissioner of Patents, Wellington. Photostat copies of any specifications will be supplied for a small fee on application to the Patent Office.

No.	Description	Applicant
96182	Sheep Dipping (dropping sheep into tank), March 26, 1947, (Drawing)	H. H. Ronalds.



This comprises a 4-wheeled conveyer truck the bottom of which is formed of 2 sectional parts 10a and 10b arranged endwise in the truck's length and pivoted on axles 11 so that each part may assume a normal horizontal position continuously with the other for use as a floor or platform, supported on cross shafts 13, or may be turned on its pivots 11 by means of levers 12 and 14 to form with the other a discharge chute through which sheep can be dropped into a dipping vat below.

88277	Spinner Bait for Fishing,	I. S. Macdonald.
89939	Truck Digging Attachment for Tractor,	T. K. Anderson.
90765	Wool Scouring (removal of brand marks),	R. D. Coghill.
92286	Cutting Edge Insert for Ploughshare,	J. A. Stormlund.
95657	Hay Loading Machine (baled hay),	E. F. Rudd and W. D. Rudd.
97176	Fruitcleaner and Polisher,	A. B. Masters.
97243	Winnowing Tea and the like,	H. Sutherland.
97482	Construction of Top Edge of Cheese Vat,	F. O. Pedersen.

the spreading of trace elements from helicopters and planes, and with the creation of artificial rain by "cloud seeding."

Better Equipment Wanted

New implements for soil tilling, contour ploughing, or the harvesting of difficult crops such as subterranean clover seed are being tried, and still better equipment is wanted. Improved farrowing houses, new methods in combating infectious diseases (for example, mastitis treatment), or better bird scarers will find a ready market.

In America plant breeders take advantage of their patent act by applying and being granted protection for many new species of plants, provided the latter can be propagated vegetatively.

It will be apparent that in a country like New Zealand, where the overwhelming portion of the national income is derived from the work of and contributed by the man on the land, progress and efficiency of the primary industry must to a large extent be dependent on the use made of the latest inventions and developments in that field. This becomes even more important as world conditions return to normal, as competition in a far-away market is getting keener every day, and last but not least, as better and cheaper synthetic fibres and fats are produced in increasing quantities. The primary industry will no doubt take up the challenge and the inventive genius of the farming community find the right answers. To help in this direction "The Journal of Agriculture," in co-operation with the New Zealand Patent Office, will publish a monthly abstract (the first of which appears on the preceding page) of a selection of the latest inventions accepted in New Zealand which are thought of particular interest to primary industry.

☆

GRADING POINTS FOR EXPORT BUTTER AND CHEESE

Leading Factory Averages for Year Ended July 31, 1949

Contributed by the DAIRY DIVISION.

BUTTER-MANUFACTURING companies which obtained an average grade of 93.75 points or more and cheese-manufacturing companies which obtained an average grade of 92.75 points or more during the year ended July 31, 1949, are listed below in order of merit. Of the total listed 22 butter and 20 cheese factories are in the North Island and 7 butter and 12 cheese factories in the South Island.

Creamery Butter

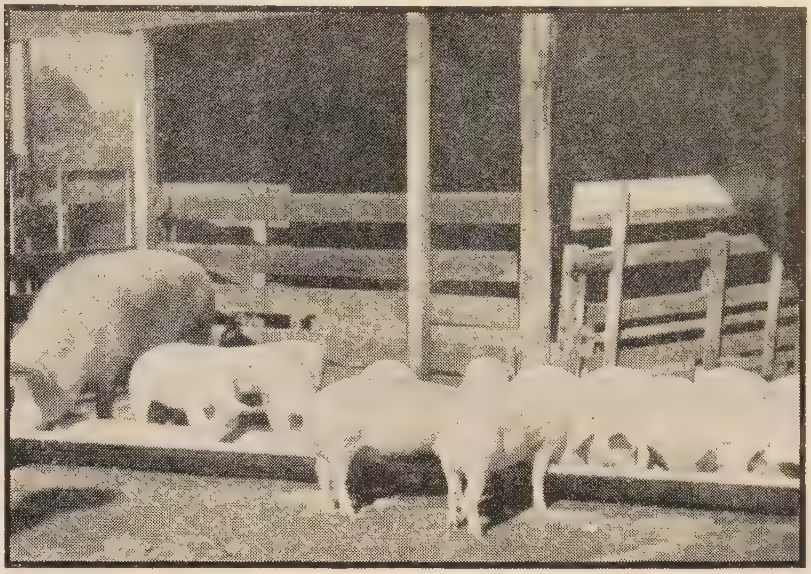
Company	Registered number	Brand	Tonnage graded	Average grade points	Grading port
Westland ..	145	Westland	436	94.470	Lyttelton
United	1296	Whariti	237	94.304	Wellington
Inter-Wanganui	6	Inter-Wanganui	236	94.279	Lyttelton
Wairoa	1345	Wairoa	119	94.277	Hastings
Konini	1203	Konini	699	94.248	Wellington
Karamea ..	1570	Karamea	278	94.217	Lyttelton
Rodney	394	Rodney	664	94.143	Auckland
Golden Bay ..	146	Sovereign	679	94.109	Wellington
Rangitikei ..	1360	Rangitikei	612	94.072	Castlecliff
Kaikoura ..	302	Kai	301	94.070	Lyttelton
Collingwood ..	1254	Golden Hills	302	94.048	Wellington
Wangaehu ..	1326	Wangaehu	440	94.030	Castlecliff
Kuku-Manakau	905	Ohau	364	94.006	Wellington
Awahuri ..	664	Red Rose	775	94.002	Wellington
Murchison ..	1888	Airship	196	94.001	Lyttelton
Taihape ..	1188	Tikapu	149	93.960	Castlecliff
Mangorei ..	345	Mangorei	1059	93.922	New Plymouth
Matakana ..	1375	Matakana	562	93.912	Auckland
Tarurutangi ..	728	Champion	205	93.900	New Plymouth
Uruti	300	Uruti	217	93.897	New Plymouth
Cheltenham ..	3	Pakeha	1264	93.866	Wellington
Te Aroha-Thames Valley ..	344	Overseas	2408	93.838	Auckland
Kia Ora ..	926	Kia Ora	606	93.830	Gisborne
Levin	910	Lake	1095	93.801	Wellington
N.Z. Dairy (Ngatea) ..	291	Anchor	1716	93.794	Auckland
Maungaturoto	1407	Otamatea	2272	93.781	Auckland
Tolaga Bay ..	1007	Tolaga Bay	185	93.770	Gisborne
Rata	938	Rata	607	93.767	Wellington
Kairanga ..	1768	Longburn	615	93.766	Wellington

Cheese

Company	Registered number	Brand	Tonnage graded	Average grade points	Grading port
North Taranaki (Onaero) ..	723	Flax	152	93.134	New Plymouth
Brydone ..	1821	Brydone	367	93.133	Bluff
Kaupokonui (Kapuni branch)	1629	Kaupokonui	441	93.078	Patea
Wright's Bush	206	Wright's Bush	314	93.0[illegible]	Bluff
Waverley ..	1834	Oturi	443	92.984	Patea
Glenham ..	1484	Glenham	191	92.953	Bluff
Tamaki ..	1463	Bell	432	92.919	Wellington
Eltham (Rawhitiroa)	1036	Eltham	517	92.905	New Plymouth
Oteramika ..	813	Oteramika	260	92.903	Bluff
Awarua	545	Awarua	416	92.902	Bluff
North Taranaki (Waipapa) ..	212	Flax	510	92.901	New Plymouth
Normanby ..	24	Steering Wheel	1031	92.891	Patea
Mataura ..	38	Mataura	485	92.878	Bluff
Dalefield ..	9	Dalefield	1092	92.861	Wellington
Okato-Puniho (Puniho branch)	48	Okato	549	92.841	New Plymouth
Lower Valley ..	322	Lower Valley	152	92.821	Wellington
Bell Block ..	488	Bell Block	544	92.813	New Plymouth
Brooklands ..	1619	Brooklands	331	92.808	New Plymouth
Ngaire	25	Triumph	864	92.795	New Plymouth
Tuturau ..	132	Tuturau	75	92.794	Bluff
Otamita ..	17	Otamita	55	92.789	Bluff
Oxford	15	Oxford	409	92.786	New Plymouth
Kahui	493	Kahui	221	92.782	New Plymouth
Cape Egmont ..	632	Cape Egmont	1588	92.778	New Plymouth
Greytown-Wairarapa	529	Greytown	801	92.774	Wellington
Pembroke ..	234	Pembroke	540	92.772	New Plymouth
Cardiff	10	C.C.C.	683	92.770	New Plymouth
Morton Mains	1604	Morton Mains	214	92.770	Bluff
Mokotua ..	67	Mokotua	215	92.764	Bluff
T. L Joll (Kapuni branch)	1668	Maori Chief	1022	92.761	Patea
Tisbury	701	Tisbury	242	92.757	Bluff
Wyndham ..	59	Wyndham	444	92.752	Bluff

Prevention of Pig Losses on the Farm

IN the last issue of the "Journal" an article contributed by the Livestock Division dealt with the causes of the losses of pigs through condemnation at the works and how these losses could be reduced by the correct treatment of the conditions and diseases causing carcasses to be condemned. This article by the Livestock Division, which will be concluded in next month's issue of the "Journal," describes the treatment and prevention of ailments and parasitic conditions resulting in losses on the farm, which are probably greater than those recorded in the works.



The basis of profitable pig production is the raising of large litters of healthy and quick-growing pigs. Good management of the breeding sows aims at securing high average numbers born and the reduction of losses to a minimum.

FROM existing data it appears that 25 to 30 per cent. of all pigs born in this country perish before the litter is weaned. Most of them are either born dead, die very soon after birth, or are overlain, and many farmers feel that there is very little they can do about such losses. However, the significant differences in results achieved by some farmers and those obtained by others indicate that production can be increased through knowledge of the pitfalls and the application of this knowledge in attention to detail in management. It is certain that no other aspect of pig management will repay attention better than the study of the causes of losses in litters. If these losses were reduced to even half, it would mean that the present production of pigs could be obtained with 10,000 fewer sows or, alternatively, better use of the present number of sows would provide an extra 100,000 pigs for fattening each year.

The causes of most of the losses in young pigs are given below, together with notes on prevention and treatment where specific troubles are involved.

Pig producers with sick pigs are entitled to receive the assistance of the local pig council supervisor to obtain the advice of a qualified veterinarian. Most pig producers today are members of a veterinary club, and thus advice is more readily available than it has ever been before. Proper diagnosis of the trouble is essential, and no written advice can take the place of the personal services of a veterinarian in treating ailments of animals.

Inadequate Feeding of Pregnant Sow

Inadequate or improper feeding of the sow results in poorly-developed piglets, which lack constitution and resistance to infection. They are weakly, make poor attempts to suckle, and are much more liable to succumb to inclement weather within the first day or two. Survivors are more liable to overlying by the sow and are highly susceptible to scours, navel-ill, and other specific troubles affecting suckers.

Though sows may become too fat during their dry period, a far more common fault is that they are undernourished, and though they may appear to be in fair order at farrowing, they have not had adequate protein-rich feed in the latter part of pregnancy to build up body reserves and well-developed piglets. Quality rather than quantity is required in the sow's ration, and during the last 6 weeks of pregnancy she should have at least 2 gallons of skimmed milk or 2lb. of meat meal daily in addition to the grazing and other bulk feeds she may be getting.

It is a mistake to leave individual feeding until the sow is brought in to her farrowing pen at, say, 3 weeks before she is due to farrow. Thus, individual dry-sow feeding bails in the piggery layout should be used more widely than they are today. In the final week the bulk of the ration should be reduced and, though the sow's bowels should be kept normal through exercise and access to grazing, she should be kept on a light ration until she has settled down again after farrowing. A gradual increase in the ration to a maximum after 3 weeks or so is then sufficient to maintain the sow in good condition and avoid digestive upsets which may interrupt her milk supply and make her more liable to overlie her piglets.

Management at Farrowing

Though there is little an attendant can do to help a sow at farrowing, observation of the farrowing may well be worth the trouble, provided the sow is used to the attendant and is not upset by his presence. Normally if the sow has been properly accustomed to her farrowing quarters and provided with a little short bedding, she will make her farrowing bed and should not then be disturbed; nothing but clean water shoud be put in her trough. If the observer notices that the sow is listless or clumsy or exhibits any cannibalistic tendency, he may, in a quiet manner, give such assistance as may be necessary or remove the piglets until farrowing is complete and then return them to the sow for suckling.

If a high proportion of the litter is overlain and there are no complications such as milk fever or other abnormal symptoms which could cause overlying, it is possible that the sow is of a careless, poor mothering temperament, and it is therefore not worth persevering with her as a breeding sow.

A draughtproof farrowing house of 8ft. x 8ft. floor area with control yard as recommended in plans obtainable from the Department of Agriculture or district pig councils is a help in reducing losses. Though there is some difference of opinion about farrowing rails, bedding, etc., it is felt that under New Zealand conditions, where attention at farrowing is frequently impracticable, they are worth the small cost involved. A limited amount of short bedding only should be used. A floor with a slope of 8in. in 5ft. to a hover board or farrowing rail, under which the piglets get protection, is recommended in some overseas countries. Experience with this type of floor in this country is as yet insufficient to make any recommendation upon it.

MASSEY AGRICULTURAL COLLEGE

Palmerston North

SHORT FARMING COURSES 1950

The College will be offering the following Short Farming Courses in 1950:—

14th FEB. to 5th MAY

11 weeks' Course in

DAIRY FARMING

11 weeks' Course in

SHEEP FARMING

●

23rd MAY to 30th JUNE

6 weeks' Course in

DAIRY FARMING

6 weeks' Course in

SHEEP FARMING

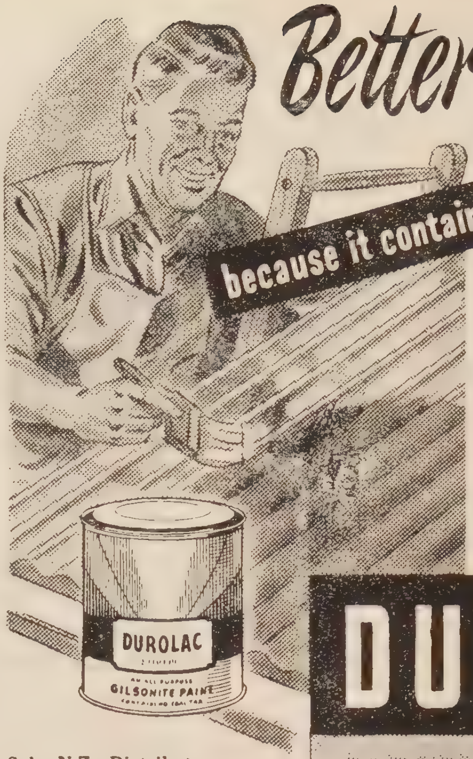
●

Full information may be obtained on application to—

The Registrar,
Massey Agricultural College,
Palmerston North.

Better Protection

because it contains GILSONITE



It is the addition of Gilsonite which gives DUROLAC protecting and waterproofing properties. Use DUROLAC black or colours on farm buildings, tanks, troughs, implements, to prevent rust — guard against rot. For roofs, Durolac red, green and silver (containing pure aluminium pigment), gives permanent protection against sun and weather. DUROLAC is easily applied with either brush or spray outfit. And do not forget that Durolac Silver insulates sun's rays up to 15 per cent.

DUROLAC

BITUMINOUS PAINT

WATERPROOFS AND WEATHERPROOFS

Sole N.Z. Distributors:
DOMINION SALES CORPORATION LTD.
Auckland, Wellington, Christchurch, Dunedin.
Sold everywhere.

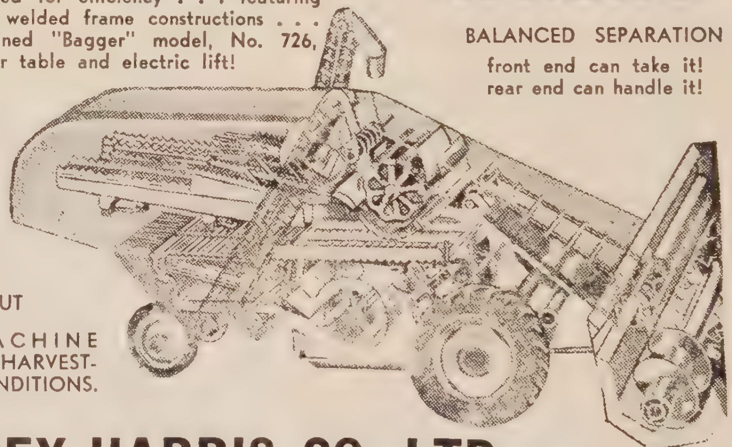
---

when you think of Self-propelled think of

MASSEY-HARRIS

● Fully tested for efficiency . . . featuring rigid and welded frame constructions . . . a streamlined "Bagger" model, No. 726, with auger table and electric lift!

BALANCED SEPARATION
front end can take it!
rear end can handle it!



FULL 8½ft. CUT

● THE MACHINE FOR ALL HARVESTING CONDITIONS.

MASSEY-HARRIS CO. LTD.
Head Office, CHRISTCHURCH.
Branches at: AUCKLAND, PALMERSTON NORTH, and DUNEDIN.
AGENCIES EVERYWHERE.

"The Service Arm of the N.Z. Farm."

Abortion

When abortion occurs pigs are born prematurely and before they are capable of separate existence. The most common cause is nutritional disorder through deficiencies in the feed supply, sudden changes in diet, or unwholesome feeds. Frights, slips, rough handling, and overcrowding can cause violent contraction of the womb, resulting in abortion. It is suspected, however, that the germ causing contagious abortion is responsible for a certain amount of temporary or permanent sterility in pigs in New Zealand.

By proper care and feeding cases of abortion occurring among sows in New Zealand can be avoided. Retained afterbirth is frequently a complication, and this is explained in a later section of this article. The sow should be allowed a rest after being cleaned up and not put back to the boar until the second or third heat period after treatment.

Milk Fever

If, immediately before or within a day or two after farrowing, sows show symptoms of abnormal excitement or drowsiness, grinding of teeth, or frothing or dribbling that are accompanied by loss of appetite, and unsteady gait, paralysis, and semi-consciousness progressing to complete coma, milk fever should be suspected. It may be distinguished from septic infections after farrowing by the fact that the sow's temperature is normal (102.6 degrees F.) or slightly subnormal.

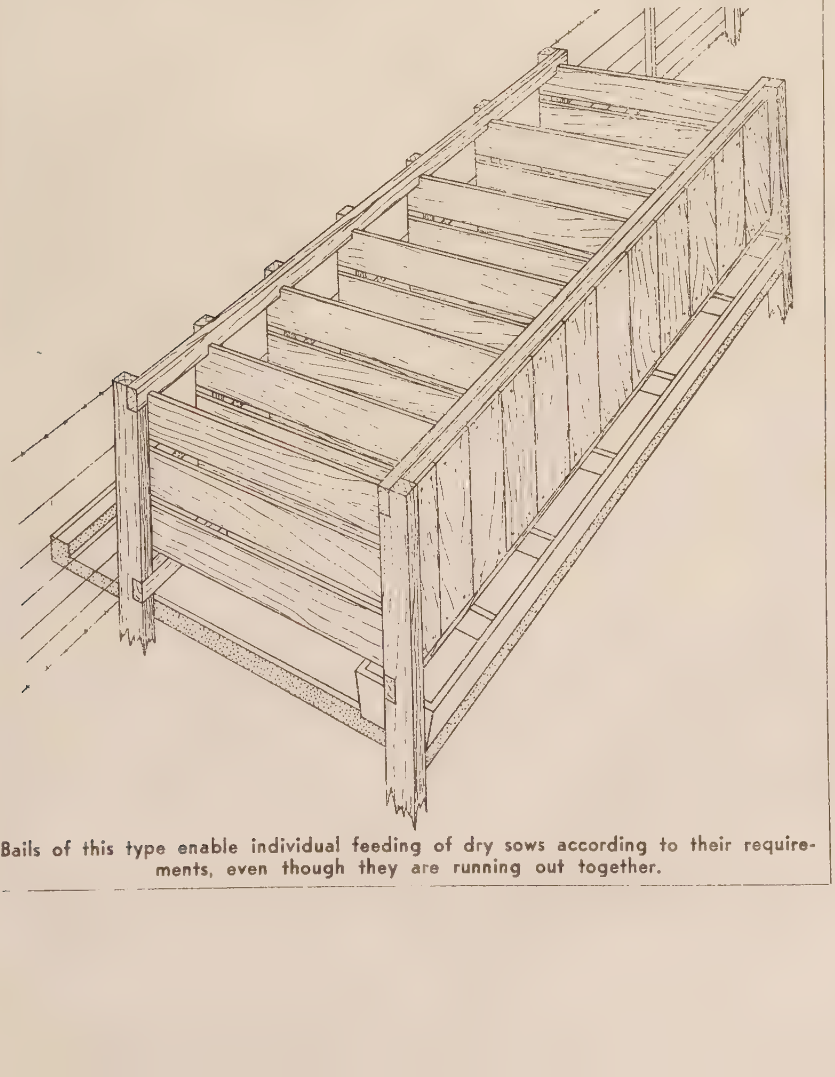
This disease is caused by a sudden fall in the calcium level in the blood, and this can be corrected by an injection of calcium borogluconate given in the same way as is used in treating milk fever in cows. The injection for a sow consists of ½oz. of calcium borogluconate boiled in 3 fl. oz. of water. After it has been cooled to blood heat it is injected under the loose skin of the neck, elbow, or flank and is massaged into the tissues. Only occasionally is a second injection necessary. Borogluconate may be obtained from any chemist.

Inflation of the udder may be practised if no calcium gluconate is on hand. No teat siphon is required. The teat is placed in the end of the connection. The teats should be carefully cleaned with a mild disinfectant solution before inflating.

Milk fever is rare in sows on dairy farms, but has been seen where sows were heavily fed, such as on properties where swill or garbage is used.

Eversion of the Womb

Symptoms of eversion of the womb are obvious, and immediate action is required if loss of the sow is to be prevented. The everted womb must be caught up in a clean towel previously rung out in a disinfectant solution at correct strength, and the sow must be got into a position where her hindquarters can be elevated by means of ropes on her hind legs preparatory to replacing the womb.



Bails of this type enable individual feeding of dry sows according to their requirements, even though they are running out together.

The everted mass must be thoroughly cleaned and any swelling reduced by running cold water over it and gently massaging until the size is reduced so that it can be returned to its proper position. Flood the passage with a warm antiseptic solution and leave the sow with her hindquarters elevated until the discomfort of the operation has subsided. Siphon out the solution, then put two tape stitches across the vulva, or insert two safety-pins to prevent a recurrence when the sow gets on her feet again. Keep the sow's bowels open and avoid bulky feeding for some time.

Prevention lies mainly along the lines of avoiding too fat condition in sows at farrowing and ensuring that constipation is never allowed to develop.

Constipation

Sows should have access to grazing, and if at any time before farrowing a tendency to constipation is noted, this should be immediately countered by giving 1 to 3lb. of molasses in the feed as required. If the constipation develops suddenly just before farrowing, a dose of up to ½ pint of liquid medicinal paraffin should be given.

Retention of Afterbirth

If the ration of the in-pig sow has contained grazing or other greenfeed and any cereal meals used have been properly balanced with minerals, the afterbirth should normally come away easily soon after the birth of the last pig. Serious consequences, including temporary or permanent sterility and even blood poisoning and death, may follow unless action is taken to facilitate proper cleansing. Whatever is done, pulling, which will tear the delicate membranes of the womb, must be avoided. A full dose of opening medicine, such as 2 or 3oz. of Epsom-salt, according to the size of the sow, may be given in water or the first light milk feed. A douche with a warm disinfectant solution at correct strength for internal use may be helpful. This must be run in through a funnel and rubber tubing and siphoned off after a few minutes.

Troubles in Sows after Parturition

Failure of Milk Supply

Failure of the milk supply may be caused by hormone failure. This can be corrected only by injection, and a veterinarian should be consulted for this purpose. Obvious troubles at parturition, as outlined above, may be responsible for delayed lactation or poor milk supply, as may be poor feeding of the sow before farrowing. The way each of these causes may be avoided has been outlined. If none of these is the cause, the inherited milking propensities of the sow are poor and she is not worth persevering with as a breeding animal. In fact, the strain from which she comes, and particularly the sire and dam, should be suspect and only used for future breeding purposes if the general performance level of sows bred is satisfactory.

FARMERS—Put

FIRES

OUT before they put you out!

Fight Fires the Modern Way —with a BROWN BROS.'

FIRE FIGHTING UNIT

A small fire can develop and burn out a farmstead. Be prepared: our standard portable fire fighting unit (powered by a Briggs & Stratton engine) has won high praise everywhere for dependability in rural fire-fighting. It's always "at the ready"—and will not let you down when fires threaten.

Full details sent on request.

Can also be used for crop irrigation, stock watering, and property de-watering.

ENQUIRE NOW!

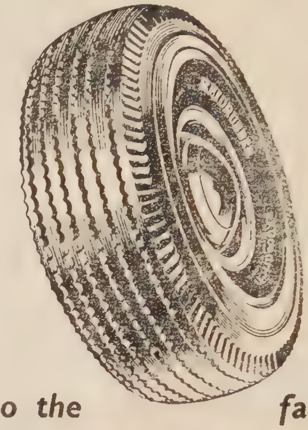
BROWN BROS
ENGINEERS LTD.
PUMPING MACHINERY SPECIALISTS

590 COLOMBO ST., CHRISTCHURCH.
Telephone 31-215. P.O. Box 548.

Fit

REIDRUBBER

MOTOR TYRES AND TUBES



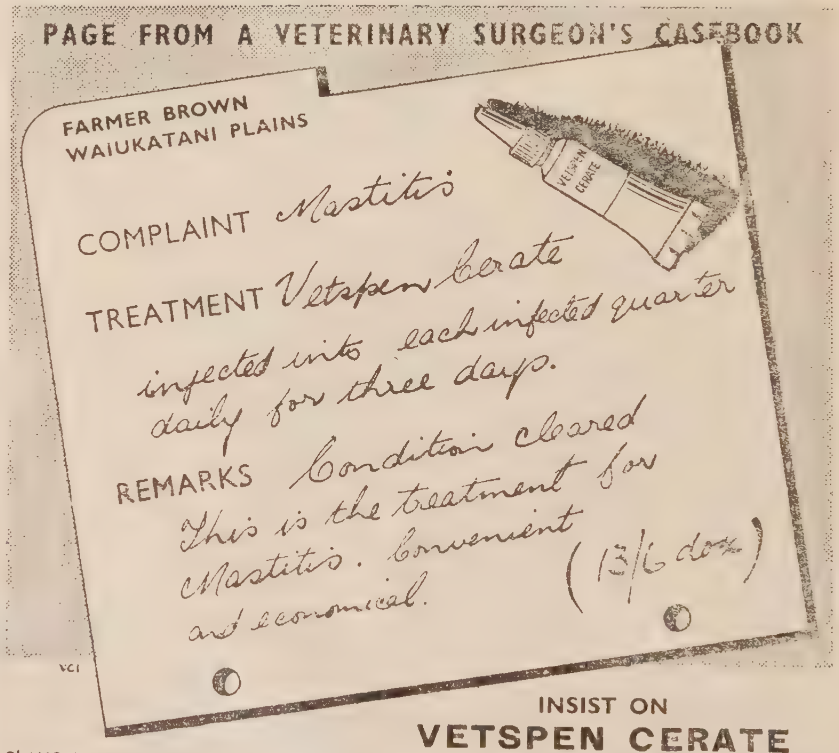
made to the famous

B. F. GOODRICH

quality and specifications

Available from your Dealer

REID NEW ZEALAND RUBBER MILLS LTD. - GREAT SOUTH ROAD - AUCKLAND



PAGE FROM A VETERINARY SURGEON'S CASEBOOK

FARMER BROWN
WAIUKATANI PLAINS

COMPLAINT Mastitis

TREATMENT Vetspen Cerate infected into each infected quarter daily for three days.

REMARKS Condition cleared This is the treatment for Mastitis. Convenient and economical. (13/6 doz.)

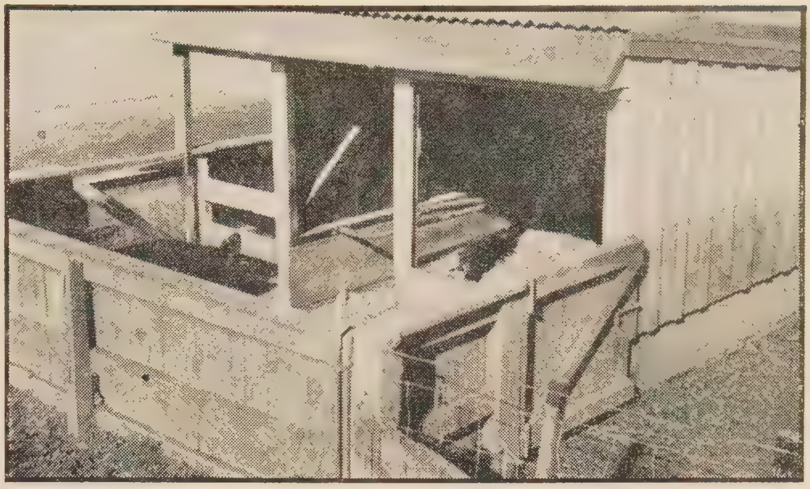
VCI

INSIST ON
VETSPEN CERATE
(Registered Pursuant to Stock Remedies Act, 1934)

GLAXO LABORATORIES LTD., PALMERSTON N.

Give your Calves
A SOLID START
with

TOMOANA
CALF
PELLETS
W. & R. FLETCHER (N.Z.) LTD.
100 LBS



A well-designed farrowing unit to which the sow is accustomed before farrowing will assist in reduction of losses at farrowing.

Mastitis

Mastitis may occur at farrowing time or at any time during the lactation. It may take the acute or chronic form in the same manner as it occurs in the dairy herd. In the acute form opening medicine should be given and fomentations, followed by thorough drying and massaging with camphorated oil, applied to affected udders. Although the sow's teat has not a single milk canal, penicillin infusion into the gland is practicable with care, and this is the best treatment available.

Acidosis

A nutritional disorder resulting in an acid condition of the blood, acidosis usually occurs in heavy milking sows which are fit at farrowing time and quickly "milk off" the fat. Incidence is highest in winter or early spring, and exposure to cold is an important predisposing factor. Symptoms may easily be confused with those of chronic indigestion. The sow may do her litter well for a time and then, after dullness and diminished appetite, lose condition rapidly and develop marked sluggishness and constipation. She may dry off, develop abnormal milk fever or paralysis, and even die unless treatment is given.

If given in time and the food supply is adequate to meet the drain on the sow, 2lb. per day of molasses in the feed for 10 days, followed by 1lb. per day, will prevent the trouble. In advanced cases a course of glucose may have to be given, both through the mouth and by injection, in the same manner as described in the section about milk fever.

Paralysis

Acidosis, as well as milk fever and tuberculosis of, or injury to, the spine, may cause paralysis in sows. Lack of assimilation of calcium to replace the heavy drain of this mineral in the sow's milk may be a cause. If the sow has had access to good grass or other greenfeed, or if some milk by-products have been included in the diet, the calcium supply should be assured. Two tablespoons of cod-liver oil may be given daily if greenfeed is scarce.

Paralysis is a condition to be prevented by good husbandry; cure is unsatisfactory.

If this treatment does not give relief and injuries are not the cause, it is probable that the sow has a tubercular or other infection of the spine and she should be destroyed.

Troubles in Sucking Pigs

Navel-ill (Joint-ill)

Though the visible symptoms of navel-ill do not show up until the pig is a week or more old, the cause is the entry of germs through the navel and possibly also through the mouth at birth. Joints swell and become very painful, resulting in the affected piglet doing badly. It may even result in the death of the piglet. Farrowing quarters should be thoroughly cleaned and disinfected before each sow farrows, and the navel cords of piglets may be dipped in tincture of iodine at birth. If the cord is heavy a ligature may be applied 2in. from the navel and the cord severed below this.

White Scours

The frothy white scour resulting from a germ infection can be very serious, and when established in a piggery may be difficult to eradicate. Preventive measures only are of any use. Thorough disinfection of the farrowing quarters and care of the sow to ensure that strong piglets with high disease resistance are born offer the best means of avoiding this trouble. An internal disinfectant may give good results in some cases.

Digestive Scours

Digestive scours are of dietetic origin and, if they occur before the piglets are taking food on their own account, must obviously be due to improper feeding or health upset of the sow, which must be found and rectified as early as possible. Deficiency of gastric secretion may occasionally be the cause of scours in piglets. This can be cured by two doses of 1 teaspoon of lactic acid. Chills should be avoided, as they may cause the onset of scours.

If the scours occur after the piglets have started consuming food from the creep or other trough, the cause probably lies in unsuitable or unwholesome food. Creep troughs should be cleaned out daily and the meals used should be low in fibre and easily digestible. Skimmed milk or whey should always have roughly the same degree of acidity and should not be left in the trough for longer than the time between feeds. If any is left when feeding is repeated, this should be emptied out before the new feed is put in the trough.

Anaemia

Often the first sign of anaemia is a scour in plump, fast-growing pigs of 10 days to a fortnight old, with heavy, jerky breathing, followed by general weakness and refusal to suck. Soon the lining membranes of the eyes and mouth show a bleached appearance, the coat becomes harsh and "starey," and, unless treatment is given, death may occur in a few hours or in a week or two.

The trouble seldom occurs in litters that are born and run outside, and is caused by lack of iron, and possibly other minerals, in the sow's milk. Where pigs are farrowed indoors and the weather prevents their being allowed access to outside runs a sod should be dug and placed in the farrowing house or yard. Piglets rooting in this will secure the minute amounts of iron and other minerals they require. The turf should be changed as necessary.

Some means must be found of dosing each affected piglet. Probably the best method is to paint on to the sow's udder several times a day the following mixture: 3oz. of sulphate of iron, 1 drachm of copper sulphate, 1 pint of molasses, and 1 pint of warm water.

Worms

Piglets infested with worms may scour, but this condition will not respond to any of the treatments given in the preceding sections. It will be dealt with in the concluding section of this article in the next issue of the "Journal."

General Ailments of Piglets

Other troubles in piglets include pigs born with very little or no hair and too weak to live. Iodine deficiency is the cause in these cases, and dosing of the pregnant sow during the latter half of pregnancy is necessary. Two tablespoons weekly of a mixture of 1 drachm of potassium iodide and a quart of water given in the feed is all that is required.

Piglets born with sharp eye-teeth injure one another in fighting, particularly round the mouth, and a condition known as "scabby mouth" may result. Some pig keepers favour snipping off the offending teeth, but unless these are actually causing injury to the sow's udder, it is probably better to treat the wounds on small pigs with tincture of iodine or other antiseptic, such as acriflavine. Damage is frequently caused in snipping off the eye-teeth which is worse than that resulting from injuries to other piglets in fighting.

Chorea, "shivers," or "trembles" may vary from very slight spasmodic shivering to such incessant and violent trembling that the piglets cannot hold on to a teat to suckle, but the cause is unknown and no treatment is available. It does not appear to be hereditary, and any pigs which can be reared should be saved. There appears to be no reason why they should not be used for breeding. The usual tendency is for the trouble to disappear gradually after the first few days.

Losses of whole litters sometimes occur after a day or two during which they appear to be getting along well; quite suddenly the piglets start to shiver and then lapse into a coma, death taking place in a few hours. The cause in such cases is usually ascribed to shortage of sugar in the blood, possibly resulting from a form of acidosis in the sow. Early administration of glucose by mouth or injection into the belly cavity gives a certain measure of success.

"Snuffles" or piglet influenza is not uncommon. It may occur at any stage of the pig's life and the only way of dealing with it is by good nursing, a warm bed, and nutritious food. It is caused by a virus closely related to the virus of human influenza. Pigs affected develop a temperature, run at eyes and nose, and may develop a husky cough. They lose appetite and whatever food is offered must be nutritious and appetising. It may be worth while using whole milk in the creep for this purpose.

The disease is highly infectious, and isolation is necessary to prevent spread. This, together with good nursing and nutritious food, is the essential in dealing with the trouble. Care must be exercised to ensure that pigs which have apparently recovered are not exposed to chills, or pneumonia or pleurisy may become a complication.

Piglets may show rupture in various sites. The usual ones in both sexes are near the navel and under the flank; in addition, it occurs in the scrotum of males. Rupture near the navel or under the flank requires a fairly difficult operation to correct and, to enable the pig to be taken to porker weight, it is usually sufficient to ensure that it is not fed on too bulky a ration and is not allowed to become constipated. A scrotal rupture can be corrected by an experienced operator when castration is carried out.

Rupture, like the rig or cryptorchid condition and rose or whorl on the coat of the pig, is an inherited fault and is a sign that both parents are carrying the factor which determines the development of the fault. Neither should therefore be used as a parent of any animal required for breeding.

Castration

There is no reason why losses should result from castration or abscesses, which cause loss when the pig is slaughtered, develop, provided a few simple rules are observed. The first is to castrate early; from a fortnight to a month old is usually the right stage, a little variation being desirable to allow for weather and other conditions at the time. For instance, if pigs are running out it is best to wait for dry weather; in hot weather select the cool part of the day.

It is best to have an assistant to hold the pig securely, though with a properly-constructed castrating "trough" it is possible to carry out the operation successfully single handed.

Preparation for the operation is important. The knife, of proper design for castrating, should be sharp. It should be sterilised by being boiled and then placed in strong disinfectant for 5 minutes. The skin of the scrotum and the operator's hands should be thoroughly washed and disinfected.

A bold cut should be made over the lowest part of the scrotum while the testicle is held tightly into this end of the pouch (this is, naturally, the top of the pouch, as the pig lies on its back). In this way the testicle should come quickly and cleanly through the cut. It is then grasped by the hand, and the cord, which is held taut, is scraped along its length close to the skin with the sharp edge of the knife. In this way the blood vessels are not severed by a sharp cut and bleeding is restricted to a minimum. The other testicle is removed in the same way. With young pigs no further dressing of the wound should be necessary. Certainly no strong or irritant disinfectant should be used; acriflavine or iodoform powder is suitable. The pig should be set down on its feet when released and not simply allowed to sit down on the ground. The pen in which the newly-castrated pigs are kept shoud be clean and dry.

Three distinct types of infection may invade castration wounds if methods have been faulty. These result in either (a) simple abscesses, (b) necrotic ulcers, or (c) schirrous cord. Though the aim must be to prevent these complications developing, they should not be neglected if they occur.

Abscesses must be lanced at the lowest point when "ripe," and after the pus is expelled the cavity must be carefully irrigated with a reliable antiseptic. Irrigation may have to be repeated and drainage facilitated for several days to ensure that the abscess heals and does not simply close and form again.

Necrotic ulcers will be described in the section on necrosis in the second part of this article.

Schirrous cord, which is more difficult to detect, is a fibrous thickening of the stump of the severed cord. If slight, it may pass unnoticed until the pig is dressed at the works. In serious cases it may develop to the size of a man's fist, and, travelling inward, may cause peritonitis. Unless the pig can be kept in isolated, clean, "hospital" conditions, it is probably best not to attempt surgical correction, but if a careful watch is kept and the infection noticed at an early stage, a method of curing the condition exists in the administration of 10 grains daily of potassium iodide until signs of iodine poisoning begin to show. After an interval of a week or so this treatment can be continued for a further period if necessary.

Rickets

Pronounced cases of rickets are evident through the curved, misshapen limb bones which result. Stiff, enlarged, "coarse" joints may be the result of a mild form of the trouble, which arises through lack of assimilation of calcium, either because of its absence from the feed or the lack of vitamin D, which is necessary for the assimilation of the mineral. The body can manufacture its own vitamin D by exposure to sunlight, and therefore it is chiefly in housed pigs that the trouble occurs. In countries where grain feeding is used extensively the trouble is much more prevalent than in New Zealand, where calcium-rich dairy by-products form the basic feed supply. The danger of rickets is greater during autumn and winter when little or no dairy by-products are available and the alternative foods are not rich in calcium. At the same time pigs are frequently kept indoors to a greater extent at that time of the year.

If rickets appear in suckers which are kept indoors during winter, affected pigs should be given ½ to 1 teaspoon of cod-liver oil, or other vitamin-rich fish-liver oil. Up to 1 or 2 tablespoons per day may be required by older pigs, which must be kept indoors. In addition, when dairy by-products are in short supply, finely-ground limestone should be supplied. If home-grown corn, cereal, and root crops are being used, the most convenient form in which to supply the necessary calcium is to mix 3cwt. of finely-ground limestone, 1cwt. of common salt, and 1cwt. of superphosphate, and supply this either as a 3 per cent. mixture in the cereal meal used or as a lick in a separate box.

It must be remembered that with whey feeding acidity develops fairly rapidly and requires to be checked; 1lb. of finely-ground limestone should be stirred into each 40-gallon drum of whey.

Investigation into Spread of Chukor

THE assistance of farmers and residents of rural districts is sought by the Department of Zoology of the University of Otago in an investigation it is carrying out into the distribution and spread of the chukor, a game bird which was introduced into New Zealand from India about 20 years ago.

The points on which the Department of Zoology requires information are:—

1. Where the birds are found at present.
2. The year in which they appeared in those places.
3. Information about their early distribution.

Any information which might be helpful in this investigation should be sent to the Department of Zoology, University of Otago, Otago Museum, Dunedin.

SUBSCRIPTION RENEWALS

Renewals of subscriptions to the "New Zealand Journal of Agriculture" should be paid to the nearest office of the Department of Agriculture. Subscribers can ensure continuity of delivery by paying their subscriptions as soon as possible after receiving their renewal notices and at least one month before the old subscription expires. When payment is made the renewal notice should accompany the subscription to ensure that the correct details are recorded.

REMOVING SURPLUS HONEY : PRODUCTION OF SECTION HONEY

Seasonal Notes for the Domestic Beekeeper

THE methods most suited to the domestic beekeeper for the removal of his surplus crop of honey and the production of section honey are described in this article by R. Goddard, Apiary Instructor, Department of Agriculture, Tauranga.

A FINE, warm day should be chosen for preparing to take surplus honey and the honey should be examined to ensure that all is fully ripened, that is, all cells are completely capped over. The domestic beekeeper who has one or two hives will find that this operation can be carried out efficiently by using a bee brush. First, the outer frame should be removed from the super and adhering bees dislodged in front of the hive, then in quick succession each frame should be lifted out and brushed separately. Alternatively, by using a little smoke on the bees, the frames may be brushed while in the super on the hive. It is advisable to place an empty super near the hive stand to take the combs of honey which have been brushed free of bees.

When carrying out the above manipulations care should be taken to ensure that

1. The smoke is not excessive, as this taints the honey, and
2. The bee brush does not become clogged with honey, as this will kill some bees and anger others, resulting in excessive stinging.

Bee Escape Boards

Beekeepers who are averse to brushing bees will find the Porter bee escape, when fitted into a flat, cleated board the same size as a super, an ideal way to remove surplus honey. The success of this operation depends on good equipment and the manner in which the beekeeper does the work. The escape should be examined to ensure that it is in good working order and is not blocked by dead bees, etc. Excessive burr comb, which may block the exit of bees, should be scraped off the top of the frames underneath the super to be removed. Above all, though it seems unimportant, place the escape board the right way up. Carry out this manipulation in the evening and by next morning the super of honey should be free of bees.

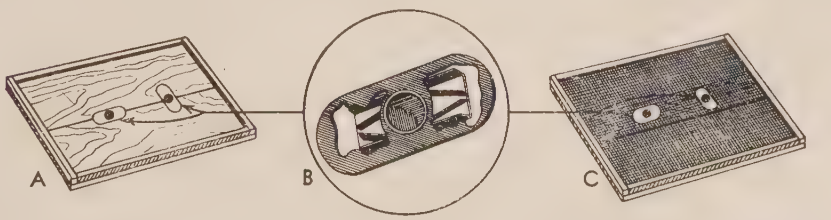
A super of finished sections ready for removal.

In districts where cold nights are experienced beekeepers prefer to use the Hodgson bee escape board, which consists of a Porter bee escape fitted into a gauze frame. This ventilated board allows the warm air to rise from the colony below and the honey above is thus kept warm. This type of escape is not a success if it is used on warm nights or is placed next to the brood nest, as the bees seldom leave the super of honey under these conditions because of the proximity of the main cluster below.

Section Honey Production

Those domestic beekeepers who have not the equipment necessary to extract honey from the comb sometimes prefer to produce section or comb honey. Production of this type is not easy and good crops cannot be gained merely by piling supers upon the hive. Only the best and strongest of colonies should be used, as it is essential that the hive be "boiling over with bees." Although this condition may result in swarming, the risk must be taken.

Sometimes great difficulty is experienced in enticing bees into section frames, but the use of a bait consisting of partly drawn comb usually helps to overcome this problem. However, if the hive is at the right strength and the super not given until the main flow has begun, the bees generally will work the sections. It is considered desirable to remove all sections from the super as soon as they are fully capped; otherwise they will become "travel-stained" and look most unattractive.



A—Bee escape board. B—Porter bee escape. C—Hodgson ventilated wire type of bee escape.

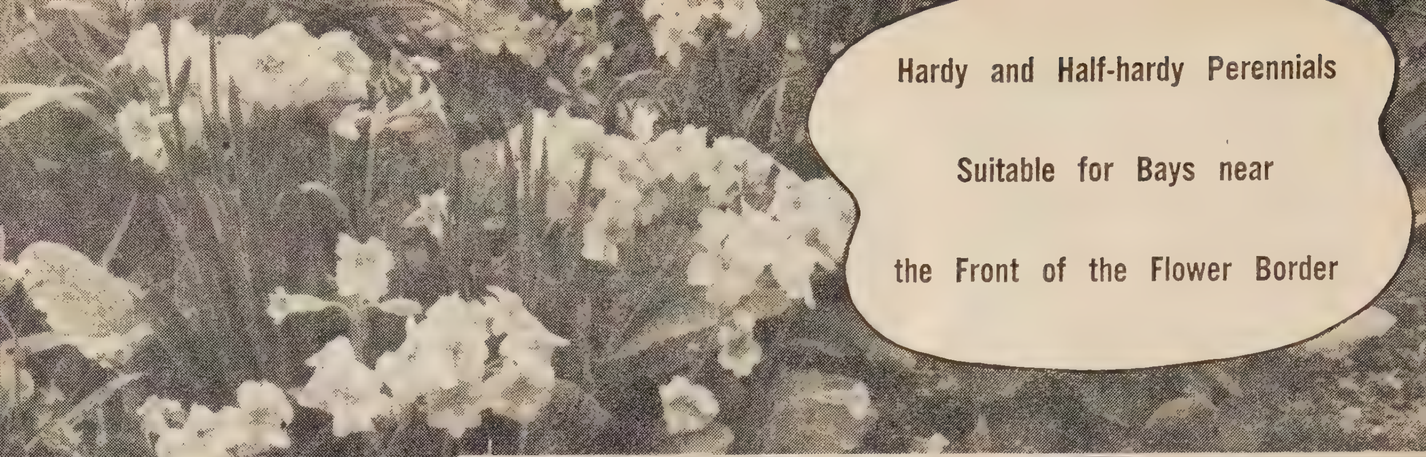
During the past few years there has been a shortage of section frames, and many beekeepers have resorted to the production of cut comb honey. This entails supering in the normal manner, but instead of extracting the honey the comb is cut into three equal sizes, which, when drained and wrapped in cellophane, form quite an attractive pack, provided new combs only are used. However, it is difficult to transport without damage and should be consumed quickly before the honey begins to granulate in the comb.

Extracting Preparations

Domestic beekeepers who intend extracting their own crop should prepare their honey house for this operation. All unnecessary gear should be shifted and stored, and utensils should be sterilised thoroughly with boiling water. Ensure that all equipment is in good working order.

Supers of honey should not be kept for any length of time, especially in damp surroundings. Honey readily absorbs moisture, and if stored in a damp, heavy atmosphere, early fermentation will probably occur. A good rule to adopt is never take honey from the hives until extracting preparations have been completed.

Hardy and Half-hardy Perennials Suitable for Bays near the Front of the Flower Border



PRIMULA VARIABILIS

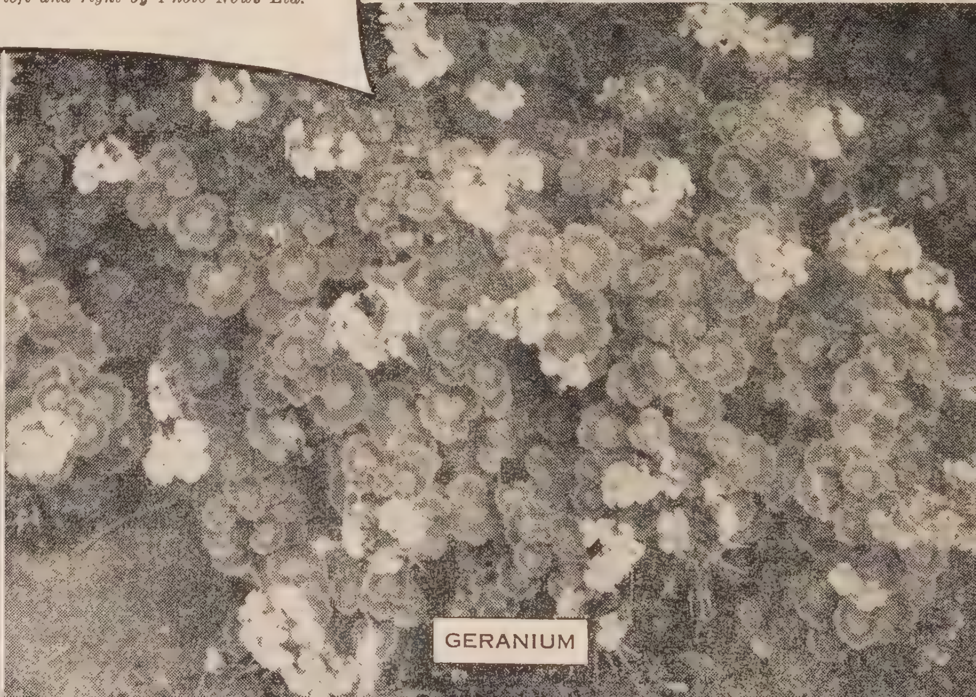
POLYANTHUS

Name	Common name	Approximate height	Colour
Alyssum saxatile	Pepperwort	1ft.	Yellow
Arabis alpina	Wall or rock cress	6in.	White
Arabis alpina rosea		6in.	Pink
Aubrietia deltoidea and named varieties		3 to 4in.	Purple, lavender, pink shades
Chrysanthemum frutescens	Paris daisy	3ft.	White, yellow, pink
Gaillardia grandiflora and named varieties		1½ to 2ft.	Mainly orange yellow and reds
Gazania species		6in. to 1ft.	Various
Geraniums, varieties		1 to 3ft.	Various
Heuchera sanguinea		1 to 1½ft.	Red
Kalanchoe (Crassula) coccinea		1ft.	Scarlet
Lithospermum prostratum		4in.	Blue
Primula variabilis	Polyanthus	1ft.	Various; fine and showy
Primula vulgaris	Primrose	4 to 6in.	Various
Saxifraga umbrosa	London pride	1ft.	Pink
Verbena venosa		2ft.	Claret purple
Viola tricolor and varieties	Pansy	6in.	Various
Viola cornuta and hybrids	Violas	6in.	Various

—*H. P. THOMAS, Vegetable Instructor, Department of Agriculture, Wanganui.*

Upper photograph by Douglas Elliott; lower left and right by Photo News Ltd.

VIOLA



GERANIUM

Midsummer Neglect can Rob the Flower Gardener of his Rewards

By M. J. BARNETT,
Director of Reserves to the
Christchurch City Council.

A SURVEY of activities in the average New Zealand garden would show that the advent of spring brought a general and instinctive desire to plant, to sow, and to put the garden in order. Usually this activity is maintained fairly constantly throughout the succeeding months up to the summer holiday season, but when midsummer arrives the school vacations and annual leave make a break in the well-ordered and regular routine work of the garden, with the result that it is likely to be neglected, for the time being at least. Lawns go unmown, weeds grow apace, choice plants languish for the want of timely attention or support, beds and borders become untidy, and there is a general air of neglect.

[*Jack Welsh and Sons photo.*

Care of rock gardens at this time of year includes removing spent flowers not required for seed and ensuring that robustly growing plants do not smother less-vigorous plants.

STRANGE as it may seem, this temporary state of affairs has a disheartening effect on all but the genuinely interested gardeners. Apparently, once the interest is allowed to flag, reviving it again is difficult. Perhaps the enticements of the seaside, the country, and outdoor games outweigh the more passive pleasures of horticulture. While summer attractions are made the most of, an active interest in the garden should be maintained, for only by sustained activity will lasting enjoyment be obtained from it. The more effort is lavished on it, the more it will flourish and induce that sense of satisfaction and pride in achievement—"the sweet solace of labour"—which is the recompense of those who make their gardening "a labour of love." The attitude that autumn is approaching and that matters will be put to rights when more time is available can lead to the garden becoming master of the gardener.

Though by January most planting will have been completed, beds and borders will be well filled with flowering plants, there will be little sowing of seed to be done, and shrubs will require little attention, nevertheless much routine work and general maintenance is required.

Roses

The first crop of rose blooms will be over, and as a preventive against attacks of mildew, rust, and black spot the bushes should be sprayed with an approved fungicide at least twice before the second crop of flower buds begins to show colour; full instructions were given in the October "Journal."

The summer pruning of rose bushes should be attended to immediately the first crop of bloom is over. Summer pruning consists of removing the weaker growths that have already flowered and are not sufficiently strong to warrant their being retained for future growth, and of shortening back the stronger growths that have bloomed. These growths should not be pruned severely, but merely cut back to two or three growth buds below the spent flower stem. Growths out of proportion with the rest may be cut back a little harder to improve the general habit and appearance of the bushes.

The tying in of strong young growths of climbing and rambler roses required to replace old and worn-out stems should be continued. The old stems should be removed later when the annual pruning is attended to.

Lilies

Both *Lilium candidum*, better known as the Christmas or madonna lily, and *Lilium testaceum*, the Nankeen lily, will have finished flowering by the middle of January, and the old flower stems should be cut off at ground level and burnt. The dreaded botrytis disease which frequently affects lilies, particularly the two species mentioned, may be present in a resting form in spent leaves and stems, and if infected material is added to the compost heap, the chances are that the disease will be spread to other parts of the garden with the compost.

Unlike most lilies, neither *Lilium candidum* nor *L. testaceum* has a distinct dormant period, for no sooner is their flowering period over than fresh growth from the bulbs is developed in the form of radical leaves at ground level. Therefore, if dividing the bulbs or shifting them to fresh sites is necessary, this work should be done toward the end of January.

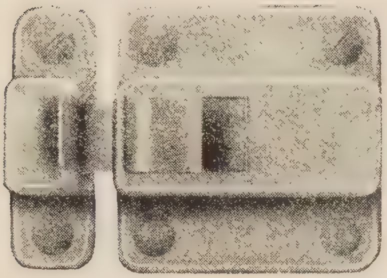
Both kinds succeed best in a deep, reasonably rich, well-drained soil which is always in good mechanical condition—that is, a soil which does not cohere into a sticky mass when wet or into hard lumps when dry. That is one of the reasons why many lilies succeed better when planted adjacent to certain shrubs, such as azaleas and rhododendrons. Not only do these shrubs prefer similar soil conditions, but the innumerable fibrous roots from them assist materially in keeping the soil friable for the lilies. Both the species mentioned are very susceptible to the effects of cold currents of air, so it is essential that they be planted in positions where they are protected from cold draughts and biting winds.

Lawns

By January the growth of grass will have steadied considerably and, if need be, the grass catcher on the lawn mower can be dispensed with. However, regular mowing should be continued. Too frequently this work tends to be curtailed as the grass becomes less vigorous in its growth, with the result that the bents—the flower stalks of the grass—are enabled to develop to such a length that the mower cannot remove them. The smooth, inviting aspect of a lawn can be spoilt by grass stalks sticking up indiscriminately throughout its surface.

In many districts on the lighter soils, and where summer brings dry conditions, lawns quickly show signs of browning off, and if adequate water is not applied, in time they suffer to

Over one million
PALLO
Cupboard Catches
in use in New Zealand



If you want a cupboard catch that will stand up to wear and rough treatment and still maintain its good looks and efficiency, turn to PALLO—the Pallo single and double cupboard catches. After years of continual improvement the Pallo Cupboard Catch, with its fine quality chromium finish, is as sturdy and reliable as continual cupboard use demands.

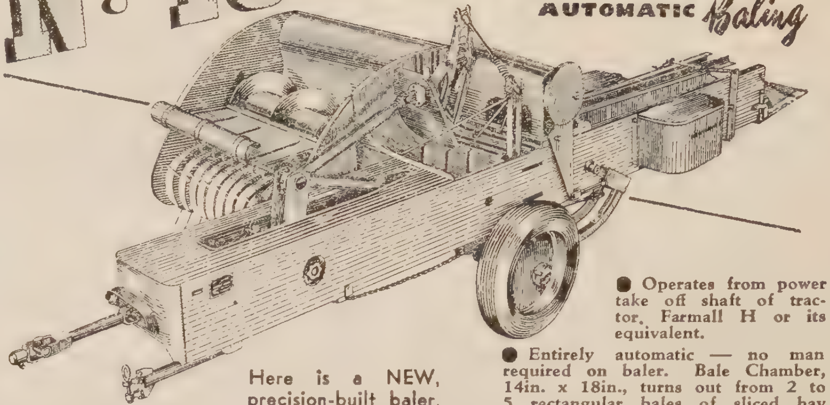
Specify Pallo — Fit Pallo
Depend on Pallo.

PALLO CUPBOARD CATCHES are available from all Hardware Merchants and Builders' Suppliers. Manufactured by Pallo Engineering Ltd., Wellington.

McCORMICK INTERNATIONAL

No. 45 PICK-UP BALER

NEW *and* FASTER AUTOMATIC *Baling*



Here is a NEW, precision-built baler, priced within the range of small farms. The No. 45 sets new high limits of capacity and money-earning ability, saves labour and lowers maintenance cost. These details show why—

- Operates from power take off shaft of tractor, Farmall H or its equivalent.
- Entirely automatic — no man required on baler. Bale Chamber, 14in. x 18in., turns out from 2 to 5 rectangular bales of sliced hay per minute, 30in. or 36in. in length.
- Adjustable tension for regulating density of bales.
- Adjustable pick-up height.
- Trouble-free knotters of entirely new design.

See the new Pick-up Baler at your local Agent or at

International Harvester Co. of N.Z. Ltd.

Auckland, Palmerston North, Wellington, Christchurch (Head Office) and Dunedin.

LEADING FARMER SAYS ABOUT —

ELASTRATOR CASTRATION AND TAILING

"HUMANE"
"QUICKER"
"SAFER"
"NO FLY STRIKE"
"NO SHOCK"
"LAMBS MOTHER-UP AT ONCE"

A BAY OF PLENTY FARMER WRITES:—

"One of the best points about the Elastrator is that it does away with the knife. It cannot be anything like the shock of other methods, as the lambs 'mother-up' in a way I have not seen before, and go ahead without check. I do 900 lambs in 5 main drafts. I have had no fly strike. There was doubt about a new method when I bought the Elastrator, but many farmers here use it now and I predict that it will become general. Killing sheets and condition of lambs is a great advertisement for Elastrator."

THIS IS THE MODERN METHOD—

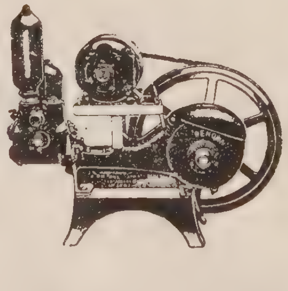
The rubber ring is affixed to the purse, above the testicles. Circulation is stopped. The testicles and purse atrophy and fall off, completing castration. Get full particulars from your Stock Agent, or direct from

ELASTRATOR CO. LTD., Box 26, Blenheim.

SEE OUR FINEST PUMP TO DATE
RENOWN "350"

THE "350" RENOWN IS YEARS AHEAD of other pumps with many high efficiency features. Quieter—has un-restricted water ways—self oiling—solid 4 leg base—very accessible—will last a lifetime — easily to-day's best buy in pumps. We are pump experts—our lifetime of experience is at your disposal.

Write for further details and FREE printea matter.



The ideal farm pump, the New Renown "350."

W. H. PRICE & SON LTD.
34-36 MANCHESTER ST. CHRISTCHURCH
P.O. Box 1084.

PUMPS 350 GALS. PER HOUR

such an extent that the health and vigour of the turf are seriously impaired. Once this happens, weeds such as the dandelion, catsear, and ribgrass, which are more tenacious than grass and by virtue of their deeper rooting systems more able to withstand the effects of droughts, obtain a foothold to the even greater detriment of the grass. In such circumstances lawns should be watered as regularly and systematically as possible. One good soaking is worth a dozen sprinklings. Though it may be pleasant of a summer evening to stand with the garden hose and spray water right and left over the garden, such performances do little permanent good and may even prove harmful. The moistening of the surface causes surface rooting and, as such moisture is readily dissipated by wind and sun, the plants suffer more readily than they would if the feeding roots were at a lower level, where moisture is available more constantly. Therefore, when watering is necessary one area at a time should be treated until the soil is reasonably well saturated.

It is most difficult for water to penetrate a surface which has been allowed to become hard and baked. Too frequently it will gravitate to the lower places and form sheets of shallow water on the lawn or flow off on to pathways and borders. In such circumstances the lawn should be pierced with a garden fork to allow a greater penetration of both air and moisture. Soil air as well as soil moisture is necessary for the well-being of grass and of most plants. For maintaining large areas of lawn in good order special turf aeration devices are available. The prongs of a garden fork driven 3 or 4in. into the surface serve the same purpose. The work is much more laborious and takes much longer than when done with a machine, but if properly carried out, it plays an important part in preserving a lawn in good condition and saving it from permanent injury. To carry out the work systematically it is a good plan to divide the lawn into 3ft. strips. Doing a strip at a time, piercing the soil at intervals of 3 or 4in., ensures that the whole surface receives adequate treatment.

Herbaceous Borders

Perhaps no garden plants show the ill effects of hot and dry weather more quickly than many of the herbaceous perennials, and the remarks about watering lawns apply with equal force to flower borders and beds. However, overhead watering does damage flowers in that the weight of the moisture on stems, foliage, and flowers frequently causes them to flop over, and if they are not securely supported, it is difficult to remedy the fault.

Where possible, beds and borders are better watered by small irrigating channels than by overhead sprinkling. Shallow channels may be made with a draw hoe, and water flowing along the channels readily percolates through the soil for a considerable distance. Given a good supply of water, a considerable area can be well soaked in a comparatively short time by regulating the flow in the channels.

After heavy rain or frequent overhead waterings the surface soil tends to compact and form a crust. The soil should be kept stirred with a hoe or fork to keep it loose and friable. Such work is sometimes referred to as dry mulching because keeping the surface in a flocculent state conserves the moisture in the soil.

Staking is part of the attention required by dahlias at this time of year. The stakes should be a few inches shorter than the plants when fully grown so that they cannot be seen later in the season.

Perennial Asters

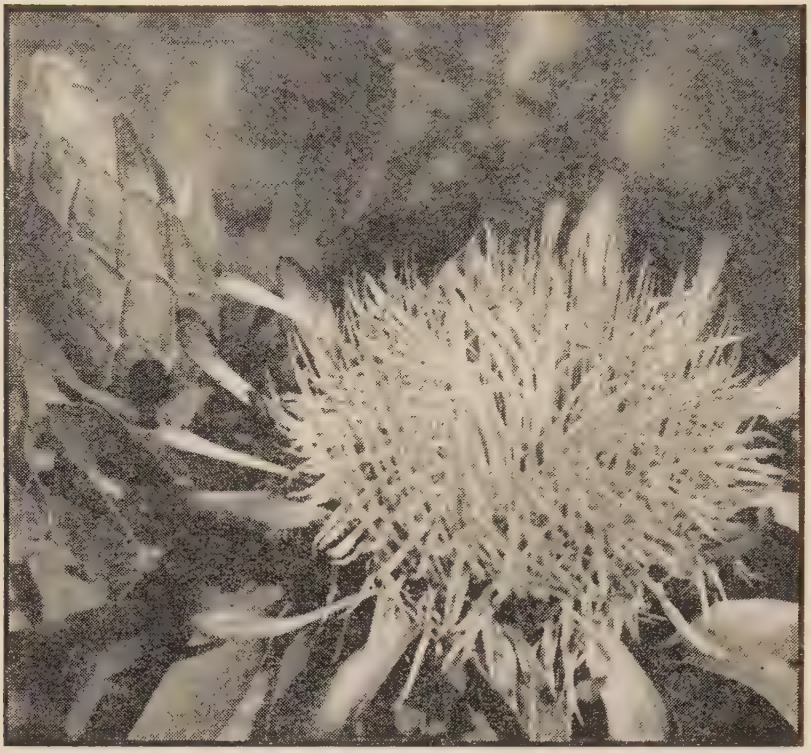
Many of the perennial asters (Michaelmas daisies) are subject to attacks of mildew at this season of the year, and unless it is controlled at once mildew will spread at an alarming rate and in some cases ruin an otherwise promising display of bloom. As a preventive, the bushes should be sprayed at least twice or thrice with lime sulphur.

Dahlias

Dahlias are now making strong growth and will require staking, watering, and disbudding. Miniature flowered varieties, such as Bishop of Llandaff, Little Diamond, Baldre, Dreamthorpe, and others used for bedding and general display need not be disbudded, but the large flowered kinds are better so treated. The usual practice is to select the largest and best-developed flower bud and to remove those immediately surrounding and below it.

Dahlias, like most plants, are subject to diseases and pests. Of the diseases, probably the worst is the virus disease, which causes a yellowish mottling of the leaves, giving the plant a debilitated appearance. Unfortunately, there is no cure for it and the only way of preventing its spread is to dig up affected plants and destroy them. Of the insect pests, thrips are the worst. By their persistent attacks these minute black insects cause malformation of the growth and discolouring of the blooms. They may be kept in check by frequent spraying of nicotine sulphate to which has been added a solution of soft soap. Some of the D.D.T. preparations now on the market have given good results. However, one of the best preventives is to keep the plants growing vigorously. Should they suffer from lack of moisture, the general health of the plant is impaired, and the thrips seem to take advantage of this weakened condition.

PROTEAS FOR THE FLOWER GARDEN



[*Douglas Elliott photos.*

Protea susannae (above) and *P. cynaroides* (below) are among the best of the protea species for growing in the flower garden.

Rock Gardens

Though rock gardens have lost the colourful glory of the spring- and early summer-flowering plants, they must not be neglected. In addition to watering, care must be taken that the more robustly growing subjects do not encroach beyond their proper confines and smother more treasured plants of less vigorous habit. Unless required for seed, all spent flowers should be removed, for some kinds if left to shed their seed have the unfortunate habit of reproducing themselves in unexpected places where they are not wanted. For example, *Geranium sanguineum* may be quite an acquisition in its proper place, but when seedlings of it appear in the midst of a colony of encrusted saxifragas it becomes a pest.

Such plants as *Erinus alpinus, Linaria alpina,* and *Papaver alpinum,* which are not "permanents," should be allowed to shed their seed so that fresh young plants may appear to take the place of their parents, which have the habit of disappearing. Many of the charming miniature alpines are seen to better advantage in little crevices where they have grown from self-sown seed than where, perhaps, they have been planted with every care.

Kniphofias

The kniphofias (tritomas), better known as torch lilies or red-hot pokers, as a class will flower from early summer until mid-autumn. Most of the popular varieties now on the market are usually in full bloom during January and February. Though kniphofias frequently are planted near the margins of pools so that the vividly coloured flowers may be reflected in the water, they will succeed even in comparatively poor soil and dry situations. However, they respond to good cultivation, and the clumps should be lifted every 3 or 4 years, divided up, and replanted.

Proteas

Natives of South Africa, the proteas are grey-leaved evergreen shrubs particularly suitable for well-drained, sunny, and open situations. They will succeed in most soils, and they have the added advantage of withstanding the effects of dry weather better than most shrubs.

The bushes in general habit of growth are not elegant, but the flowers are most interesting, being conspicuous, in some cases beautiful, and when suitably arranged useful for indoor decorations. The bushes can be induced to grow more shapely by pruning them back immediately the flowers are over. Care should be taken not to prune back too hard beyond the healthy foliage.

Some of the best species for the garden are *Protea susannae, P. cynaroides, P. compacta,* and *P. longiflora.*

Carnations and Pinks

Despite the fact that the carnation has been cultivated for hundreds of years, it is still one of the most popular of garden and florists' flowers. Excluding the marguerite carnation, which is raised annually from seed, three main types are worth attention—the border carnations, in which are included the picotees and which flower once each year; the perpetual flowering carnation, which, under proper treatment, will flower for 8 or 9 months out of the year; and the perpetual border carnation, which apparently is the result of a cross between the first and second types. The larger flowers, the greater length of stem, and the longer flowering period of the perpetual carnations are qualities that have increased their popularity at the expense of the true border and picotee kinds. A few decades ago border carnations held pride of place both in gardens and at flower shows. Many old growers and lovers of the flower will recall with pleasure and longing the fine markings of the bizarre and fancy varieties. The border carnation has not disappeared from gardens, and is never likely to, and there are signs that it is becoming popular again.

[*Photo News Ltd. photo.*

Hydrangeas will rapidly be coming into bloom, and the plants must not be allowed to suffer from lack of moisture at the roots. A good mulching of compost or half-decayed farmyard manure round the roots helps to conserve the moisture in the soil. A sheltered position where they receive some protection from the strongest of the sun's rays suits hydrangeas best.

Soil Requirements

Carnations as a class are essentially sun lovers and must be given an open situation where they will receive the maximum of light and not be overshadowed by trees or shrubs. They abhor any soil that tends to be sour, but succeed in a good, loamy soil that is well drained. As they prefer an alkaline to an acid medium, lime in some form should be added to and thoroughly mixed with the soil, and for this purpose old lime rubble or mortar that has been broken up finely and passed through a ½in.-mesh riddle to remove the larger lumps is considered excellent. Not only does the rubble supply lime, but the rough particles of it assist considerably in improving the general texture of the soil. Finely ground oyster grit is a good substitute and may be used liberally. If neither of these materials is available, agricultural lime will suffice.

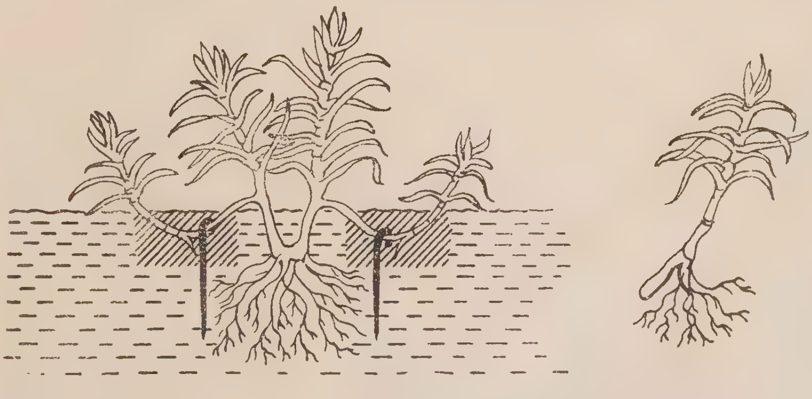
However, carnations do better in a firm rather than a loose, open soil, and though they dislike wet, sticky soils and will survive dry conditions better than the general run of garden plants, they cannot be starved with impunity. For best results they must receive regular watering and feeding during the growing season, but overhead watering and wetting of the foliage should be avoided. The original wild types of carnations (*Dianthus*), the progenitors of the present-day hybrids, grew mostly on limestone cliffs, in open, wind-swept pastures, among rocky crags, and on old castle walls—positions where drainage was perfect and excessive moisture did not collect and remain.

For flowers of good size and substance, carnations should be disbudded, all the flower buds clustered around the upper or terminal one being removed. If need be. the lower or lateral ones can be left, but when the flowers are required for cutting even these should be removed.

Propagation by Layers

As border carnations seldom give good results after the second year fresh stocks from the original plants should be propagated immediately the flowers are over. Propagation is easily effected by the natural method of layering, carried out as follows:—

Toward the end of January remove the old flower stalks. Clean round the base of the plant by removing all spent foliage and unwanted growth and the surface soil immediately underneath. Replace this soil with a layer of good compost consisting of loam, sharp river sand, and leaf mould, all of which have been passed through a ¼in.-mesh sieve. This compost forms the rooting medium in which the layers are placed. Select sturdy growths, avoiding weak ones and those inclined to rankness; take each in turn, and with a sharp knife remove the lower foliage close to the stem. At a convenient point between the older and younger parts of the growth where the stem is firm but not hard make an upward cut through a joint on the lower side. Press the layer gently into the compost below in such a manner that the "tongue" penetrates downward into the soil and away from the stem, and hold the layer firmly in position with a peg



The propagation of carnations by layering, described on this page. The surface soil is replaced by compost and the prepared layers held down by pegs of 12-gauge wire. On the right is a layer separated from the parent plant after it has rooted.

THE CULTURE OF CARNATIONS

[*Sparrow Industrial Pictures Ltd. photo.*

Carnations have been cultivated for centuries but they are still among the most popular of garden and florists' flowers.

made of 12-gauge wire. The operation is not difficult and may be carried out successfully even by the beginner. When all the layers of each plant have been put down, extra compost is added to cover the layers more adequately, made reasonably firm, and the whole given a good watering.

During dry weather the layering bed should be kept moist to induce quick rooting, which should take place within a few weeks. About the beginning of March the young layers should be severed from the parent plant by cutting through the stems between the layer and the old plant. The young plants thus severed from their parent are left undisturbed for a few weeks until they are more firmly rooted, when they can be lifted carefully and transplanted to the prepared positions in which they are to grow and flower during the following season.

Propagation by Cuttings

Border carnations may also be propagated successfully from cuttings, which should be taken from good, healthy growths, but not abnormal or weak ones. The lower leaves should be removed close to the stem and the firm part of the stem cut squarely across just below a node or joint. The cuttings should be removed when perfectly fresh and must not be allowed to wilt to the slightest degree, but should be wrapped in damp scrim or placed in an airtight container until they are ready to be inserted. Sometimes cuttings sent from a distance may arrive somewhat wilted, in which case they should be steeped in water for 12 hours to enable them to revive.

When only a limited number of plants is required an effective and convenient method is to strike or root the cuttings in a 5in. pot. The pot, which should be thoroughly cleansed, is "crocked" in the usual way—that is, about 2in. of drainage is placed in the bottom and covered with some material such as fibrous riddlings from compost, spent hops, or sphagnum moss to prevent the finer compost above from filtering down into and blocking the drainage. The compost consists of half soil and half clean river sand; some growers advocate all sand. The compost is made firm and even and moistened, after which the cuttings are dibbled in from 2 to 3in. apart. The pot is then given a good overhead watering and plunged to the rim in sawdust, coke breeze, or similar material in a close frame or a cool part of the glasshouse until the cuttings have rooted. During this period an endeavour should be made to maintain an even temperature, to keep the cuttings shaded from direct sunlight, to prevent draughts, and not to allow moisture to collect on the foliage, though during hot, dry weather spraying them lightly during the heat of the day may be necessary to prevent their wilting. As soon as the cuttings have rooted they should be transferred to boxes containing richer compost or potted up singly into 4in. pots and grown on until they are ready to be planted in open ground.

Though perpetual flowering carnations may be layered as recommended for border carnations, some growers prefer to propagate them entirely from cuttings, it being considered that plants produced from cuttings taken from about midway up the stems give better results than those layered from the basal growths.

Pinks and *Allwoodi* carnations, because of their close, dense habit of growth, are propagated more easily from cuttings, which take root comparatively easily. Many of them are excellent for massing or as an edging for the flower borders. If a large number is required, the plants may be raised easily by dibbling in the cuttings in prepared boxes of compost covered with clean sand. As each hole is made with the dibble a small quantity of the sand falls to the bottom, thus forming a base on which the cutting rests when inserted. Plants raised in this manner may be transferred directly to open ground when well rooted.

METEOROLOGICAL RECORDS FOR OCTOBER

Station	Height of station above M.S.L. (ft.)	Air temperatures in degrees (Fahrenheit)				Rainfall in inches					Bright sunshine hours
		Approx. mean	Difference from normal	Absolute maximum and minimum		Total fall	No. of days of rain	Difference from normal	Maximum fall		
				Maximum	Minimum				Amount	Date	
Kerikeri	201	58.6	+ 3.4	77.0	36.5	1.53	9		0.26	30, 31	198.1
Auckland	160	59.8	+ 2.6	74.6	46.0	2.24	16	— 1.77	0.52	31	180.4
Tauranga	10	57.6	+ 1.7	73.0	33.8	1.21	11	— 3.73	0.27	14	209.0
Ruakura	131	55.8	+ 1.0	70.7	33.8	3.62	16	— 0.39	1.04	14	199.3
Rotorua	980	55.4	+ 2.4	71.0	33.0	1.57	12	— 3.43	0.38	14	174.0
Gisborne	12	59.0	+ 2.7	80.2	32.8	1.63	11	— 0.61	0.65	10	220.4
New Plymouth	160	55.8	+ 1.5	64.5	37.6	5.12	16	— 0.45	1.20	14	183.0
Napier	5	58.7	+ 2.3	81.0	35.9	0.60	8	— 1.32	0.26	10	227.2
Taihape	2157	52.4	+ 2.6	70.3	34.0	2.30	15	— 1.06	0.41	8	
Wanganui	72	57.2	+ 2.4	73.3	39.4	1.21	13	— 2.14	0.39	14	219.0
Palmerston North	110	55.8	+ 2.0	72.0	37.0	2.93	16	— 0.62	0.50	14	156.5
Waingawa	350	55.0	+ 2.0	73.0	30.8	1.01	10	— 1.89	0.34	2	229.0
Wellington	415	54.2	+ 1.2	64.0	40.2	2.78	13	— 1.11	0.90	7	194.4
Nelson	24	55.8	+ 1.7	71.4	36.3	3.77	11	+ 0.23	1.09	8	248.0
Blenheim	12	57.2	+ 3.3	79.7	30.4	1.37	6	— 0.78	0.38	9	275.2
Hokitika	12	52.0	+ 1.2	60.0	37.8	18.03	24	+ 6.67	3.80	5	141.2
Hanmer Springs	1225	53.6	+ 3.0	77.0	26.0	2.19	10	— 1.70	1.16	9	229.4
Christchurch	22	57.3	+ 4.3	81.8	36.3	0.62	8	— 1.24	0.24	30	236.9
Ashburton	323	56.6	+ 5.0	84.4	37.2	1.13	5	— 1.07	0.43	2	208.8
Timaru	56	55.2	+ 2.6	80.2	33.0	0.65	7	— 1.21	0.20	8	212.2
Alexandra	520	55.4	+ 3.2	77.6	34.0	0.66	9	— 0.57	0.15	23	190.9
Taieri	80	54.2	+ 3.1	79.4	31.3	2.35	13	+ 0.16	0.57	5	
Invercargill	32	53.5	+ 3.3	75.0	28.0	5.07	15	+ 1.49	0.98	23	156.0

The ROLE OF PLAY IN CHILDREN'S LIVES

THE part which play should have in the growth and development of a child is the subject of this article, one of a series by Dorothy Johnson, Rural Sociologist, Department of Agriculture, Christchurch, on child care and development. It discusses principally the surroundings and environment in which children play; next month's article will deal more specifically with toys and equipment.

WATCHING children's growth and development, having the privilege of seeing how human personalities begin and grow, is a wonderful and fascinating spectacle. Even within one family children show definite individuality—in fact, amazing variety—in their ways of dealing with the manifold problems the world about them presents. The amount of development occurring in a child from birth to 5 years is stupendous, unequalled by the accomplishments of any other 5 years in life. That is partly because a year is much longer physiologically and psychologically for a child than for a man; the years 3 to 7 probably correspond to 10 or 15 years in an adult's life.

One year at 10 corresponds to 2 at 20, but the learning accomplished in the first 5 years is very great (1). It is literally a transformation. A newlyborn baby is utterly helpless, but at 5 years "he is a self-contained and conforming little citizen. He likes to please and is capable of sympathy, takes pride in clothes and in the work of his hands. He likes to be shown how and he responds to praise." Dr. Arnold Gesell, whose description that is, reminds all who watch its accomplishment that they can have deep faith in the constructive essence of growth and with that faith they can enjoy their children. This should be remembered when dealing with problems and difficulties as they occur, and action based on it will solve the problems more quickly and on a better level because the parents see them in a better perspective.

Heredity and Environment

Each child has his own way of growing up, for he inherits certain factors which determine how and when the different aspects of his growth will take place. The parents' task is really first to observe that individual inherited pattern, and then to provide the environment in which the child does his own growing toward the highest of his potentialities.

That is demanding a great deal in a few words. Observing one's offspring objectively is fairly difficult, because the child is so intimately part of the parent's life that human pride and egoism tend to distort the view. On the whole, fathers are better than mothers at this. One of the best ways is to take time to observe the children at play and to play with them from their babyhood.

Development by Play

Directly and indirectly, a good deal has been said already in these articles about children's play and the importance of its place in their development. There is no need to justify the place given to it, though it is tempting to discuss the distinction between work and play. Readers who are interested will find the subject ably outlined by Miss Lois Benjamin in her book "The Young Child and his Parents," obtainable on loan from the Country Library Service.

Play is the exercise of growing powers. Even the baby tries out all his abilities. He kicks his legs and brandishes his arms. He watches things; he handles, sucks, and bangs them; he pokes an inquiring finger in and around them. His first random movements develop into exploratory and investigating movements of hands, legs, and body. He babbles and imitates what he hears. By these activities he builds up a knowledge of the world in which he lives.

---

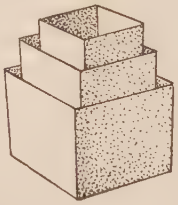
1. Lecomte du Nouy in "Human Destiny" and "Biological Time."

"The best play occupation of a tiny baby is to be supported in his pram, shielded from too keen a wind and too strong a sun, but with the opportunity to look and listen to all the exciting 'events' of his immediate environment—the wind rustling in the trees, the inter-play of sun and shadow, the barking of dogs, the clucking of hens, the chatter of children, the bustle of people going to and fro. All these varied stimuli may impinge on the baby's newly-awakening senses." (Dr. Agatha Bowley in "Natural Development of the Child.")

Things and Persons

There are two aspects of play. In one, children are exploring the world of things—manipulating them, gaining the knowledge which develops their individual skill, self-reliance, and independence. In the other, children are learning their way about in the world of persons, slowly building the intricate web which binds them to their fellows.

As they play in the world of things they learn much that will lead to perseverance, initiative, and the power of concentration. When they are tiny, their span of attention is very small, and they play for only a few minutes with each toy, going quickly from one to another. Gradually they learn to do what they purpose, and when 3 years old they can do an astonishing number of things. They will keep on doing one thing for quite a while; they will even return to the same occupation after a break. "Those moments when they give their whole attention to some task are the moments when they grow intellectually." (Miss M. V. Gutteridge, B.Sc., principal of the Kindergarten Training College, Kew, Melbourne.) Each time they meet a new situation, whether plaything or friend, and deal with it satisfactorily, they grow. They develop more power especially when their action is of their own choice rather than that of older people in their little world.



Therefore they need plenty of things to do and the right toys and equipment, space and freedom, for their play. If they have the right playing space and playthings (which does not mean the most expensive), they will show creative powers in their play, and they will be laying the foundation of qualities they will need later—for example, initiative, enthusiasm, and the will to succeed.

Indoor Playing Space

Children need space for their activities, both indoors and outdoors. If it is not possible for them to have a whole room, they should have the end of a verandah or a sunporch for their own, preferably with access to the garden. When old enough they should be able to enter and leave sunporch and garden at will. They should be allowed to realise that the space is their own, with their own possessions, and they will soon know their things and learn to respect those of other people. They need tables and chairs suitable to their size. The provision of low shelves and cupboards in which to keep their toys makes putting things away much easier, and also makes easier an understanding of and a pride in orderly arrangement.

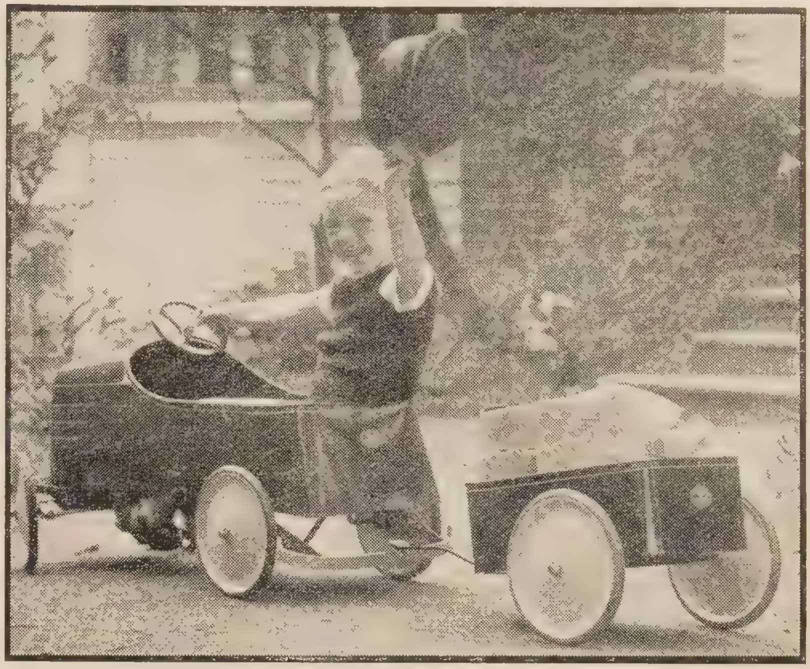
A sense of order and power to achieve it is not part of the early equipment of human beings but the result of careful teaching over quite a long period, and sometimes it can be achieved at too great a cost. Creativeness can be sacrificed if order is too rigidly enforced, and the wisdom of making the putting away of toys an issue resulting in a battle of wills between adults and children is doubtful. In any case, in the interest of encouraging children's powers of concentration, they must be able to come back to their "work" and resume where they left off.

Respect for Children's Activities

Children should not be interrupted needlessly in their play. It is as important to them as adult's work is, and both rightly resent interruption. If meals or baths are due, give children warning—for example, that after the train has gone once more round the track it will be time to wash their hands for lunch. If possible they should be allowed to return to their play where they left off.

This applies to older children, too. There is a salutary warning about it in Dr. K. Walker's interesting book, "I Talk of Dreams." This book is a special kind of autobiography in that the author, who is a physiologist and psychologist, sets out to analyse his early experiences and trace their impact on his later life. The whole book is well worth reading, especially for parents. This is what he says (page 21):—

"Never take the play of a child lightly, for it is the most serious and the most urgent of all occupations, of greater importance even than a grown-up's affairs, since it is the father of these. I doubt whether I have ever completely forgiven my mother for her irreverent attitude to my play. Somewhere in those unlit and not very pleasant cellars of the mind, which the analysts are always seeking to enter, there lie the remnants of an old grudge against her for



[Sparrow Industrial Pictures Ltd. photo.

her lack of understanding. But, then, all women, to my way of thinking, were like that. To be called in from exploring the wild lands that lay between the back of the bicycle shed and the garden wall, and to be told that I must change my damp stockings in case I caught cold, was nothing less than an insult. Black Hawk did not wear stockings, and were he, like me, forced to do so he would not notice that they were damp, or if he did, he would never be so feeble as to catch cold. Dry stockings and wool next the skin did not belong to my world, and I bitterly resented these interruptions. It was ignominious to be messed about by women. At such times I felt how wise I had been to make that vow of celibacy to St. Andrew."

Outdoor Playing Space

Take a careful and critical look at the garden provided for the children. How many and what kind of resources has it to fill their days with interesting things to do? It is not expensive equipment that is needed, but opportunities for different kinds of activities. Is there space to learn to run swiftly, a good path on which to push and pull toys, and as wide a space of green grass as possible? Children may grow up clumsy simply because they have not had the opportunity to practise swift running. It is perhaps somewhat demanding to ask that the garden should provide a little hill to run up and down, but if parents can perform that kind of magic, they will be well rewarded by the endless fun to the under fours (and perhaps the over fours, too). At that age a little hill calls one to run up and roll down, to crawl up and run down.

Shrubs of various sizes are necessary, just to race round in the early years and for dodging and hiding among in the latter social games of "tig" and hide-and-seek. Trees in themselves make a garden the adventurous place it should be to children. They will climb them sooner or later, and get their first glimpses of the wider horizons and that glorious feeling of conquest, of being "on top." The memory will sustain them in later years as they work their way up the long and steep slopes in other fields of endeavour. To give practice for the real tree climbing, put a 5-barred fence or gate somewhere within the limits of the play space. Later the farm gates serve a similar purpose. Plenty of running and climbing is essential.

It will be noticed that climbing adventures are taken for granted. Even small children must climb, and providing opportunities within their scope is better than having to watch helplessly quite perilous adventure on the wash-house roof. Even in that situation, to preserve the toddler's unconscious confidence is the only way to coax him down. Rushing after him up the ladder which tempted him up will not be effective if there is a drop on the other 3 sides, because he will retreat. But with a smile and "That's clever to be up there. Where did you climb up? See if you can be clever enough to get down, too," he can be guided down.

Another aspect of climbing is illustrated by the story of the wise woman who, hearing a commotion in the orchard, found she had to extricate her grandson, who was stuck high up an apple tree. When he had his feet safely on the ground, she said, "Now go and climb it again." He did, and without getting into difficulties—his confidence intact.

Water Games

Most country children are fortunate in having a small creek somewhere, but for the youngest ones a small concrete paddling pool in the garden is a source of delight. Even a tub or a trough or water will provide many happy hours. They need a jug with wide-mouthed and narrow-mouthed containers into which to pour water. Waterproof aprons can be worn on days too chilly for the wearing of bathing suits. Clothes should be warm but light and not hampering.

Is there any need for children to come in out of the rain? With a raincoat, a waterproof hat, and gumboots, a rainy day becomes a source of delightful adventures instead of developing into a trial of cooped-up frustration and irritations—that is, if the rain is not too heavy or incessant.

Appreciation of Nature

Country children score in having the love of nature fostered from their earliest years by the opportunity to watch, touch, look after, and understand the living creatures around them—flowers, birds, and animals. Every week they need a little excursion to explore a piece of the surrounding country on foot. Driving round in a car is no substitute, though it extends the field of observation.

Fortunate are the children whose parents explore the neighbourhood of bush, hill, valley, and seashore with them. That brings imperishable treasures to those who share in the adventures in all that they yield of awareness and appreciation of the beauty of the world in which they live—the variety of the earth formations, the plant, bird, and animal life, the wonder of the sky, the sun, the moon, and the stars, the sunrise and sunset, and seasons. There is room for awe as well as understanding in the developing life of children.

STUFFED PRUNES
THE CENTREPIECE
STUFFED CELERY
FISH PATTIES AND SAUSAGE ROLLS
OYSTER PATTIES

Party Savouries

ORANGE BLOSSOM

THE hostess planning a party for 20 or 30 people must make careful arrangements for the refreshments. She will wish to serve food which looks attractive and colourful, to have variety so that all tastes may be pleased, and to strike a balance between foods which must be cooked or heated at the last moment and those which may be prepared completely in advance. The last point is very important, as assistance is not always available, and the capacity of the hostess (and of the oven) must not be overtaxed in an endeavour to heat too many things at once. This article by Norma K. Metson, Rural Sociologist, Department of Agriculture, Wellington, describes the preparation of a variety of savouries, both hot and cold.

THOUGH many savouries are more appetising when hot, some such as bacon and egg pie and sausage rolls are just as good cold. The usual hot savouries are those with pastry as a base, those which contain bacon, and those which are cooked by being fried in deep fat. Savoury scones and biscuits, stuffed celery, prunes, eggs, and tomatoes, aspic jellies, and delicacies such as crayfish and tinned salmon are served cold.

Ingredients

The selection of ingredients depends to a large extent on what the housewife has on hand (quite ordinary items may become fascinating in combination), on the season of the year (which determines the availability of vegetables such as celery, spring onions, and cucumber), and on whether there are shops within reach which provide ready-made cocktail sausages, olives, tinned mushrooms, and similar exotic foodstuffs. The appetites and preferences of the guests must also be considered; hungry men probably are just as happy with thin bread and butter and a liberal supply of cheese, pickled onions, hot saveloys, and savoury eggs as with a more elaborate selection.

Toothpicks are essential for the preparation of some savouries and for serving others easily and attractively. Puff pastry, thick white sauce, crisp lettuce, thinly-cut medium-fat bacon, and a selection of cheeses—mild, tasty and cream—are the basic foods. To these are added a variety of materials which may be fresh, tinned, or pickled, raw or cooked—cocktail sausages, saveloys, luncheon meats, whitebait, onions, prunes, mushrooms, oysters, nuts, olives, fish, chutneys, relishes, and savoury spreads; vegetables such as peas, asparagus, corn, cucumber, celery, tomatoes, radishes, and spring onions, with lemons, mint, parsley, chives, mustard, cress, and watercress for garnishes and added flavour. Only small quantities are required, so though some of the items are expensive they do not represent a great extravagance. For centrepieces and attractive serving, toothpicks surmounted by savoury morsels may be stuck into a firm, well-shaped cabbage heart or polished grapefruit and cucumbers.

Puff Pastry

Puff pastry is used in a wide variety of savouries—as shaped cases for savoury fillings, for pinwheel circles, sausage rolls, small pies, tarts, and turnovers, and for large pies like bacon and egg which are cut for serving. Hollow cases should be made separately in advance and may be stored in an airtight tin for several days if necessary. Fillings are put into the cases when the main preparations for the party are being made. The whole savoury is then reheated just before being served.

Puff pastry of good quality can be bought, which is a great help to the housewife who lacks the time for the rather long process of making it, who is unable to obtain suitable fat (lard and butter are best) in sufficient quantities, or who cannot rely on uniform quality in the pastry which she makes herself. Pastry in the making must be kept cold and the ingredients should be chilled beforehand if possible. For puff pastry use equal weights of flour and fat—for example, 8oz. of flour, 8oz. of fat, ½ teaspoon of salt, and water to mix until the dough just clings together. Divide the fat into 4 equal portions. Rub 2oz. of fat into the flour, mix in the water, and roll the dough out thinly. Take another portion of fat, cut it into tiny pieces, and spread them over the dough. Fold the pastry, sides to middle, ends to middle, then double, and press down the edges with a rolling pin. Leave it in a cool place for at least ¼ hour. Roll it out again, cover it with another portion of fat, fold it, and leave it to stand. Repeat the process with the last portion of fat. The pastry is then ready for cutting and shaping.

Cases

Roll the pastry to a little less than ¼in. thickness. Cut out circles about 2in. in diameter with a small biscuit cutter or tumbler. In the centre of the circle make a cut of smaller size with a large thimble, a bottle top, or the cap of a salt shaker; press down firmly, but do not cut right through the dough. Cook the pastry in a hot oven (400 to 500 degrees F.) until it is well risen and golden brown. Lift off the centre cap and hollow out the centre of each case, where there may be a small portion of partially-cooked dough. When the case has been filled replace the cap on top. One pound of pastry will make about 2½ dozen small cases.

An alternative method of making the cases is to roll the pastry thinly and cut an equal number of circles and of rings with the centre pieces completely removed. The edges of the circles are moistened with cold water and the rings stuck on top. The central cut-outs may be baked separately for caps or rerolled.

Photographs on this and opposite pages by Sparrow Industrial Pictures Ltd.

What is the COST of BORACURE?

There are two kinds of Boracure estimates—(1) a "Guaranteed Service" Quotation which covers all required treatment for 5 years to a complete property, and (2) a "Gallonage Applied" Quotation which covers a specific treatment only without additional service treatments.

IN PLAN 1, the property owner pays two-thirds of the contract price on completion of the initial treatment and withholds the remaining third to pay in instalments as subsequent service inspections and treatments are given. IN PLAN 2, the property owner pays for a specified treatment only according to the number of gallons of Boracure required for the job. Any additional work requested is undertaken as a new and separate job.

OBVIOUSLY there cannot be one set price for Boracure service. Conditions differ in every job. Some badly infected areas soak up more toxic than others. Soft woods take more than hard. Varnished and painted areas are difficult to treat. Some jobs are easy to get at, others are most awkward. Some require painstaking injection work. Some can be treated quickly with motorised equipment.

When a Boracure Inspector prepares an estimate he makes a thorough examination, submits a comprehensive written report and advises you on the best method of tackling your problem.

Boracure service is not expensive, actually only a few shillings per gallon of toxic are required to do a thorough job. It pays to have a thorough job done by Boracure who have the trained men, the correct equipment and the best toxic for the work.

Write for Free Property Preservation Manual.

BORACURE (N.Z.) LTD.

217 LAMBTON QUAY, WELLINGTON.
Branches Throughout the Country.
Phone 40-050.

Onehunga
WOOLLENS WITH A PEDIGREE

AIR-CELL

the Blankets that Breathe

Distributors throughout N.Z. *Sargood, Son & Ewen Ltd.*

CONSISTENT QUALITY FOR 70 YEARS

SOLD EVERYWHERE
EDMONDS
PRIZE
BAKING POWDER
SURE TO RISE

Edmonds
Sure-to-Rise
BAKING POWDER

MADE FROM PURE GRAPE CREAM OF TARTAR

15·9 *A Product of T. J. Edmonds Ltd., Christchurch.*

For open tart shells shape the pastry in patty tins, line them with greaseproof paper, and weigh them down with small crusts of bread, or shape the pastry on the outside of the tins, prick them well, and cook them upside down. Tarts may also be baked with the filling in them if a lower temperature (about 400 degrees) is used.

Suitable fillings for these cases are:

Savoury scrambled egg flavoured with cheese or chopped herbs.

Chopped bacon, onion, and tomato cooked together and thickened with flour.

Thick white sauce to which has been added chopped oysters, chicken, tongue, or ham, whitebait, cooked mushrooms, or tinned or cooked corn kernels, with some of the liquid from these foods.

Turnovers

Roll puff pastry very thin and cut it into circles. Place a teaspoon of filling in the centre of each circle, moisten half the circumference with cold water, fold the other half over, and press the edges together. Dip the turnovers in slightly-beaten egg mixed with a tablespoon of water. Fry them in deep fat at 360 to 370 degrees and drain them well. For the filling use well-seasoned, minced, cooked meat or finely-chopped ham, tongue, or chicken moistened with white sauce.

Croquettes and fishballs, about a quarter the usual size, more highly seasoned, and fried in deep fat, are also good party fare.

Aspics

Aspics are made by setting flaked fish, finely-chopped meat, and vegetables in savoury jelly. Put them in a large dish and when they are set cut them in sections for serving on lettuce leaves, or make attractive shapes in small individual moulds, patty tins, egg cups, or the ice-cube tray of a refrigerator. Before turning the jelly out dip the mould in hot water for a moment.

The recipe given is for salmon jelly, but the ingredients can be varied. For example, cooked or tinned green peas and cooked diced carrots make an attractive colour combination. To form a pattern in the jelly, pour a thin layer of liquid jelly over the bottom of the mould, allow it to set a little, then arrange on it slices of tomato, radish, hard-boiled egg, cucumber, or tiny beetroot which have been dipped in jelly. Pour a little more jelly into the dish and leave it again to set before the bulk of the jellied mixture is put in.

Tomato juice used as the liquid gives an attractive red colour, but meat or fish stock, the water from cooked vegetables, or juice from tinned vegetables may be used, with a little green vegetable colouring if a more definite shade is desired. If the meat stock has been prepared from bones, it will set by itself to a soft jelly, so the amount of gelatine in the recipe may be reduced by half.

Salmon Jelly

¾lb. of tinned salmon
1 dessertspoon of chopped chives
1 dessertspoon of chopped onion
½ cup of chopped cucumber or celery
1 tablespoon of powdered gelatine
2 teacups of tomato juice
Salt, pepper, celery salt

Cutting out pastry cases with a tumbler and the cap of a salt shaker.

Flake the fish and add the chives, onion, and cucumber. Soak the gelatine in 4 tablespoons of cold water for 5 minutes, then add ½ cup of heated tomato juice and stir until the gelatine is dissolved. Add the remaining tomato juice and the seasonings. Fold in the fish mixture and leave the mixture in a mould to set. When the jelly is set, serve it on lettuce.

Other foods which may be served on curved lettuce leaves are crayfish meat, plain or seasoned with mayonnaise, tinned salmon or herring sprinkled with tomato juice, tomato quarters, spring onions, radishes, and cucumber slices. Stuffed eggs are also easier to handle if they are served with a lettuce leaf to wrap round them.

Savoury Stuffings

Stuffed eggs are most popular of the stuffed savouries, but eggs are not always available, so stuffed prunes, celery, or tomatoes may be substituted.

Stuffed eggs are served in halves, so the number of portions will be double the number of eggs used. Boil the eggs hard, having them well covered with water and turning them after they have been cooking for about a minute. When they are cooked, shell them, cut them in halves lengthways, and remove the yolks carefully. Put the yolks in a bowl, season them well with salt and pepper, add chopped parsley, chives, or cress, and moisten them with top milk or salad dressing. Other possible additions are curry powder, Worcester or tomato sauce for moistening, a few drops of onion juice, or a little tasty cheese grated very finely. Put the filling back into the egg whites and serve the eggs on lettuce.

Stuffed prunes: Select large prunes, soak them over night, and cook them gently until they are tender. Drain them and remove the stones carefully. Prunes tinned in syrup are very good to use but are more expensive. In the hollow left by the stone put a savoury filling such as cream cheese or mincemeat, and close the prune with a toothpick.

Stuffed tomatoes: Remove the skins from small tomatoes, regular in size and shape, by blanching them in boiling water followed by cold water. Cut a slice off the core end of each tomato and remove the seeds and pith. This may be used as part of the stuffing or saved for use in other dishes—in an aspic, for example. Make a savoury stuffing for the tomatoes; cheese is a good base, seasoned with salt, pepper, and chopped herbs. An alternative is mashed potato well moistened with salad dressing, with mashed green peas, sardines, chutney, or chopped hard-boiled egg added.

Stuffed celery: Attractive white stalks with a good hollow should be used. Remove the strings and cut the stalks into 2in. pieces. Fill the hollows with cheese paste (cream cheese, or ordinary cheese grated and moistened with top milk) to which has been added finely-chopped walnuts (fresh or pickled), orange juice, or chopped dates or raisins.

Bacon Savouries

Bacon rolls: Remove the rind from the bacon, using a sharp knife or a pair of kitchen scissors, and cut the rashers into pieces 3 to 4in. long. Use as fillings soaked stoned prunes, raw oysters, or mushrooms. Roll the fillings in pieces of bacon, secure the rolls with toothpicks, and cook them for 10 to 15 minutes in a hot oven or under a griller until the bacon is crisp and the filling cooked. These rolls must be served very hot straight from the oven. The oysters are angels and prunes or mushrooms devils on horseback.

Bacon and egg pies: For parties use a rectangular rather than a round tin in which to make a bacon and egg pie, as this simplifies cutting it into small pieces. Cut the bacon into pieces about 2in. square, and to make eggs go further beat them slightly before putting them into the pie or break the yolks and spread them over the dish. Press the pastry well together at the edges, but do not make a heavy double rim. The pies should be baked in advance and may be reheated for serving, but they are equally good cold.

Cheese, bacon, and potato pasties: Grate 2oz. of cheese and mix it with ½ cup of mashed potato and a little chopped parsley. Divide it into small portions, place each on half a rasher of bacon, and roll it up. Place the rolls on rectangles of short pastry. Moisten the edges of the pastry, fold them over, and press them together. Bake the pasties at 400 degrees for 15 to 20 minutes.

Savoury Mouthfuls

All sorts of titbits suitable for one or two bites can be placed on the ends of toothpicks for serving—chunks of pineapple (fresh or tinned), pickled onions, mild cheese with a variety of crisp vegetables, stuffed prunes or dates, cocktail sausages, olives, sections of saveloys, or folded rounds of luncheon meat.

Small dishes of salted nuts, popcorn, and crisp potato chips are often set around the room before the party begins so the guests may help themselves during the evening.

PATTERN PIECES FOR SMOCKED FROCK

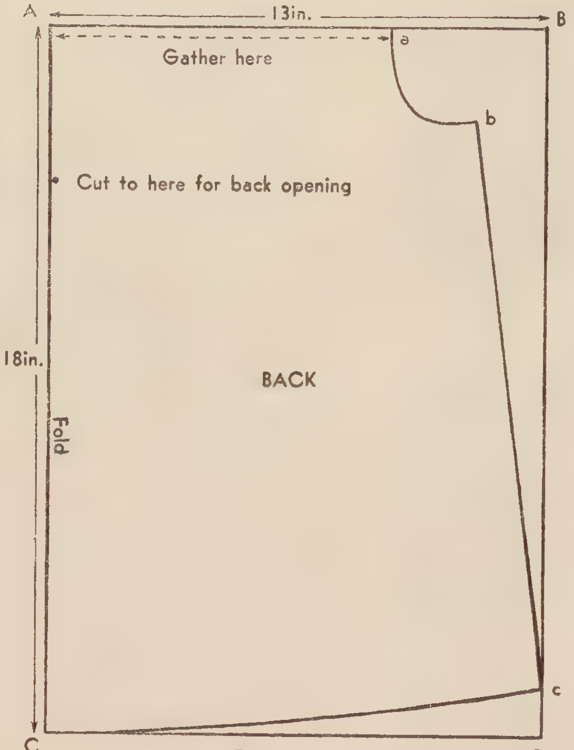

A
13in.
B
Gather here
a
b
Cut to here for back opening
18in.
BACK
Fold
c
C
D

Fig. 1

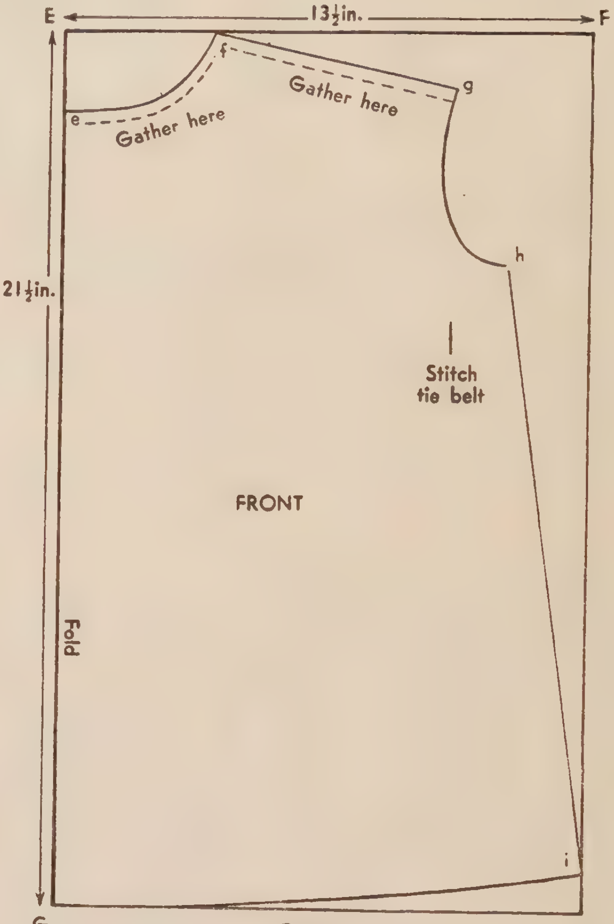

E
13½in.
F
f
g
Gather here
e
Gather here
h
21½in.
Stitch tie belt
FRONT
Fold
i
G
H

Fig. 2

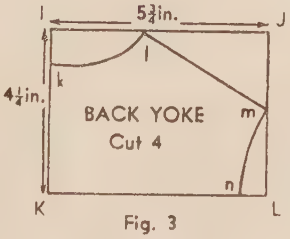

I
5¾in.
J
l
k
4¼in.
BACK YOKE
Cut 4
m
n
K
L

Fig. 3

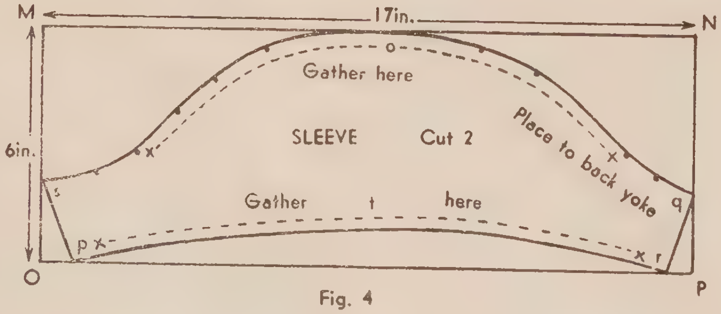

M
17in.
N
o
Gather here
SLEEVE
Cut 2
Place to back yoke
6in.
x
x
s
q
Gather
t
here
p
x
x
r
O
P

Fig. 4

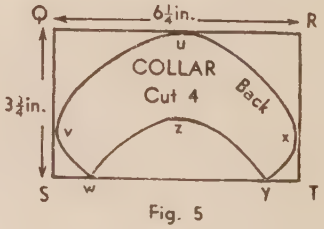
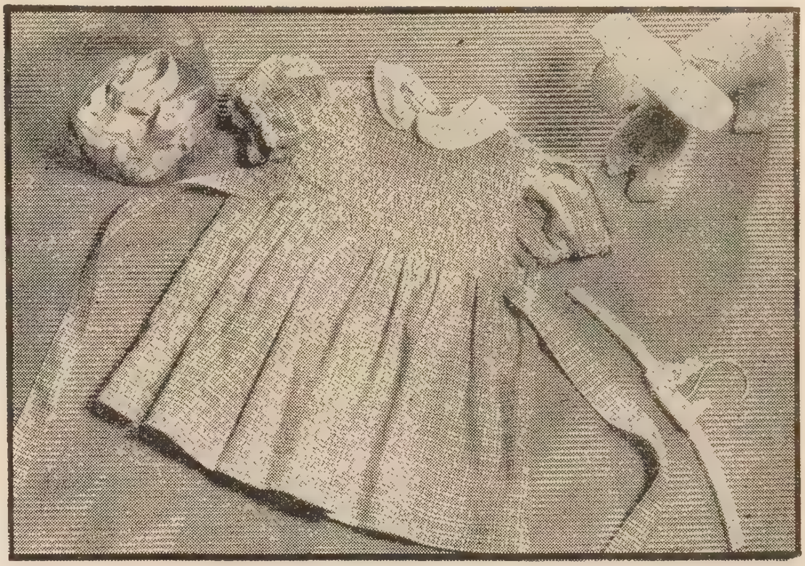

Q
6¼in.
R
u
COLLAR
Cut 4
Back
3¾in.
v
x
z
S
w
Y
T

Fig. 5

A SMOCKED SUMMER FROCK FOR A SMALL GIRL

NOTHING is fresher for a small girl's summer wear than a smocked washing frock. Whether checks, spots, stripes, or sprigged materials are chosen, the pattern should be small and dainty. Gingham is an all-time favourite, for its washing and wearing qualities are undisputed. With the advent of summer a small daughter will require several frocks of the type described in this article by Eva Topping, Rural Sociologist, Department of Agriculture, Auckland.



[*Sparrow Industrial Pictures Ltd. photo.*

THE pattern illustrated has simple lines and an easily-worked but effective smocked front. If the checks of the material are small enough—about ⅛ to 1/16in. square—no transfer is required. Pin-spotted or striped material with the spots or stripes ¼in. apart does not need a transfer.

The size of the finished frock is:—

Length from shoulder to hem	17in.
Width across front chest over smocking	10in.
Length of sleeve seam	1½in.
Width of sleeve at bottom ..	7in.
Round neckline when fastened	10in.
Width at lower edge	about 1 1/3yds.

Materials required are: 1⅜yds. of 36in.-wide cotton material; ⅛yd. or a piece about 9in. x 18in. for the collar in white or a plain colour to match the frock material (calico, haircord, and boiling silk are all suitable, and the rag-bag probably will supply a large enough piece); 2 skeins of white or coloured stranded cotton; 3 small buttons, and ½yd. of narrow tape.

Cutting a Paper Pattern

First study the diagrams to become familiar with the shapes of the pattern. Then take sheets of paper, a pencil, and a tape measure or ruler and make a pattern as follows:—

Back (Fig. 1)

Size of paper 18in. x 13in.; mark the corners A, B, C, and D as on the diagram.

From A measure 9in. toward B and mark a. From B measure 2½in. toward D and in 2in., and mark b. Join a and b as shown for the armhole.

From D measure up 1in. and mark c. Join b and c for the side seam.

Join c to C for the hemline.

Measure 4in. down from A and mark "Cut to here for back opening."

Mark the pattern "Back." Write "Gather here" along the line A-a and "Fold" at the centre back.

Front (Fig. 2)

Size of paper 21½in. x 13½in.; mark the corners E, F, G, and H.

From E measure 2in. toward G and mark e. From E measure 3¾in. toward F and mark f. Join e and f as shown for the neckline, which is straight for almost 1½in. at e.

From E measure 11in. toward F and down 1½in., and mark g. Join f and g for the shoulder seam.

From F measure 5¾in. toward H and in 2in., and mark h. Join g and h as shown for the armhole.

From H measure 1in. toward F and mark i. Join h and i for the side seam.

Join i and G for the hemline.

Measure 3½in. from F toward E and down 7in. From there draw a line 1in. down and mark it "Stitch tie belt."

Mark the pattern "Front." Write "Gather here" along the neckline (e-f) and shoulder line (f-g) and "Fold" at the centre front.

Back Yoke (Fig. 3)

Size of paper 5¾in. x 4¼in.; mark the corners I, J, K, and L.

From I measure 1in. toward K and mark k. From I measure 2½in. toward J and mark l. Join k and l as shown for the neckline.

From J measure 2in. toward L and mark m. Join l and m for the shoulder seam.

From L measure ¾in. toward K and mark n. Join m and n for the armhole.

Write "Back yoke, cut 4" on the pattern.

Sleeve (Fig. 4)

Size of paper 17in. x 6in.; mark the corners M, N, O, and P.

From M measure 8½in. toward N and mark o.

From M measure 4in. toward O and mark s.

From O measure ½in. toward P and mark p.

From P measure ½in. toward O and mark r.

From N measure 4in. toward P and mark q.

From O measure 8½in. toward P and up 1in.; mark t.

Join s-p and q-r for the sleeve seams.

Join p-t-r with a gentle curve for the lower sleeve edge.

From M measure 1½in. toward N and down 3¾in.; mark with a dot.

From M measure 2½in. toward N and down 3¼in.; mark with a dot and cross.

From M measure 3½in. toward N and down 2in.; mark with a dot.

From M measure 4½in. toward N and down 1in.; mark with a dot.

From M measure 6in. toward N and down ½in.; mark with a dot.

Join these dots to o with a smoothly-curved line.

From N measure 1in. toward M and down 3¾in.; mark with a dot.

From N measure 1½in. toward M and down 3in.; mark with a dot.

From N measure 4in. toward M and down 1in.; mark with a dot.

From N measure 5in. toward M and down ½in.; mark with a dot.

Join the dots to o as before.

Mark a cross between the second and third dots to correspond with that on the other side of the sleeve top, and write "Gather here" along the top edge between the two crosses.

Make two crosses on the lower edge about 1in. in from the side seams and write "Gather here" between them.

Write "Sleeve, cut 2" on the pattern and "Place to back yoke" on the right-hand side as shown.

Collar (Fig. 5)

Size of paper 6¼in. x 3¾in.; mark the corners Q, R, S, and T.

From Q measure 3in. toward R and mark u. From Q measure 2¼in. toward S and mark v. From S measure ¾in. toward T and mark w. Join u, v, and w with a curved line as shown.

From r measure 3in. toward T and mark x. From T measure ¾in. toward S and mark y. Join y, x, and u with a curved line.

From S measure 3in. toward T and up 1½in.; mark z. Join w, z, and y with a curved line.

Mark the pattern "Collar, cut 4" and write "Back" on the right-hand side as shown.

36 AMERICAN DOCTORS
Tested the 14 Day Palmolive Plan on 1285 Women

On women from 15 to 50, with all types of skin, with dull, dingy complexions, the Palmolive Plan was tested.

PALMOLIVE
PALMOLIVE

TESTS PROVED
that 2 out of 3 women can have
Lovelier Skin in 14 days!

If you want a complexion the envy of every woman — the admiration of every man — try the 14-Day Palmolive Plan, start to-night! Regardless of age, type of skin, or previous beauty care, 2 out of 3 women proved that the Palmolive 14-Day Plan brings these complexion improvements—less oily, smoother, younger looking, less coarse-looking, fewer tiny blemishes, less incipient blackheads, fresher, clearer colour. Start this new Beauty Plan with Palmolive Soap, and you, too, may look for these complexion improvements in only 14 days!

The Plan is easy as it can be—here's all you do, just 1-2-3!

1. Wash your face with Palmolive Soap!
2. Then for 60 seconds, massage with Palmolive's soft, lovely lather. Rinse
3. Do this three times a day for 14 days. This cleansing massage brings your skin Palmolive's full beautifying effect.

START THIS PLAN TODAY!

A SMOCKED FROCK FOR A SMALL GIRL

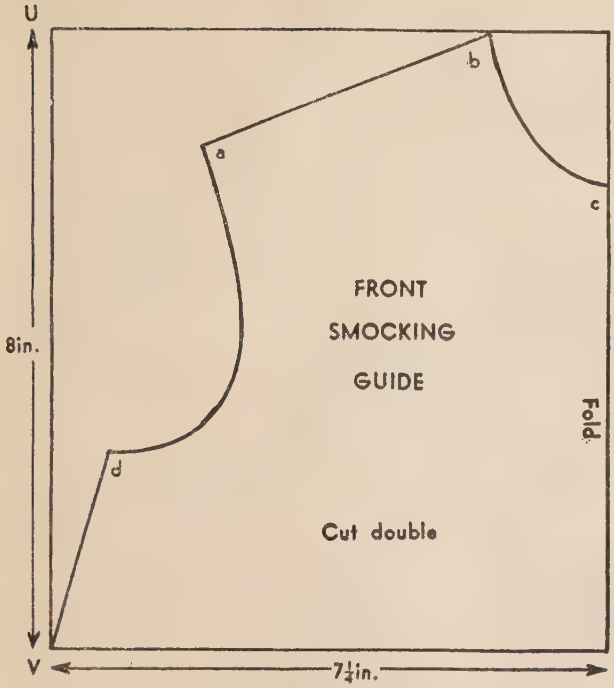


Fig. 6—Dimensions of the smocking guide.

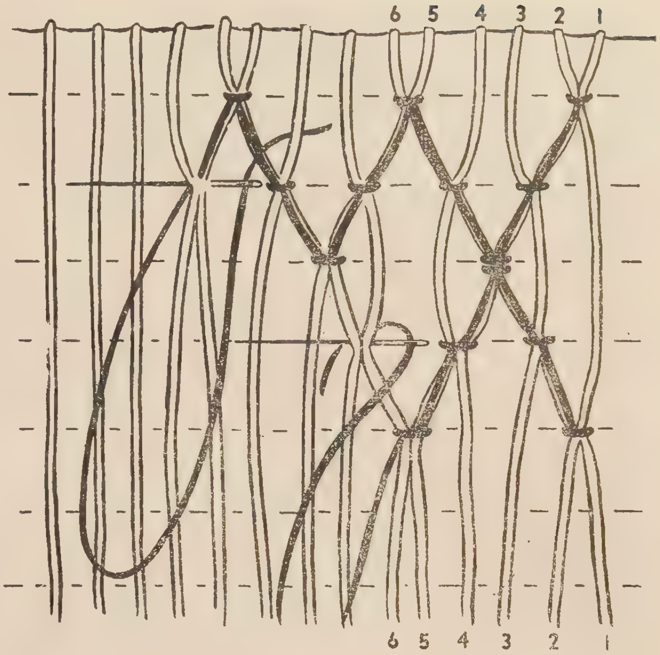


Fig. 8—Details of the smocking stitches.

These five pieces are the paper pattern from which the frock will be cut, but one more piece is required—the smocking guide for the front. It should be cut from fairly stiff paper and must be cut whole, not in halves as for the pattern.

Smocking Guide (Fig. 6)

Size of paper 14½in. x 8in., folded in halves along the long sides; mark the two open corners on the left side U and V.

From U measure 2in. toward the fold and down 1½in.; mark **a**. From U measure 5¾in. toward the fold and mark b. Join a and b for the shoulder-line.

From the top edge at the fold measure down 2in. and mark c. Join b and c with a curve for the neckline.

From V measure 2½in. toward U and ½in. in; mark d. Join d to V for the side seam.

Join a and d in a curve as shown for the armhole.

Mark the piece "Front smocking guide" and cut it out folded to make the sides symmetrical.

Turnings of ½in. are allowed in the pattern on all seams except the back yoke at the fastening edge, where the allowance is only ¼in. The pattern allows for a hem of 2¾in. with a ½in. turning.

Cutting out the Frock

Set the pattern out on the material as in Fig. 7, making sure that the centre front and centre back are on the fold. Cut four yoke pieces, two being the linings. Two lengths 22in. x 2in. for the tie belts are also needed.

Place the collar pattern on the contrasting material so that the grain runs either lengthwise or crosswise.

Front Smocking

Lay the other pieces aside and take up the front of the frock. Run rows of gathering stitches across the front with the stitches about ⅛in. apart and the rows ¼in. below each other. Keep the stitches even in length and the pleats formed regularly. When the pattern of the material is conveniently spaced, as in small checks, a transfer may not be necessary, but if one is wanted, use small-sized smocking dots, stamp them on the wrong side of the material, and make the running stitches on the wrong side too.

Make about 22 rows of stitching to attain a bodice effect for about 5½in. from the centre front neckline when finished. Start with the full-length row just below the neckline; the short rows on each shoulder can be put in afterward. Continue the stitches for the required depth. Take a length of thread for each row and leave the ends hanging free.

Next gather round the front neck and the front shoulders. Tack the front smocking guide to the back of the dress front, pull up the neck and shoulder gathers to fit the guide, and fasten them off firmly. Pull the loose threads through to the right side, insert a pin for every two rows, pull up the gathers to fit the smocking guide, and wind the threads round the pins. Pull the pleats gently from top to bottom to make them lie evenly.

Take three strands of stranded embroidery cotton in the needle and proceed as follows:—

First Row of Stitching

Insert the needle at the right-hand side of the work on the first long row of gathers. Take up the first two pleats and make a back stitch over both.

Take up the second and third pleats of the 2nd row and make a back stitch over both.

Take up the third and fourth pleats of the 3rd row and make a back stitch over both.

Take up the fourth and fifth pleats of the 2nd row and make a back stitch over both.

Take up the fifth and sixth pleats of the 1st row and make a back stitch over both.

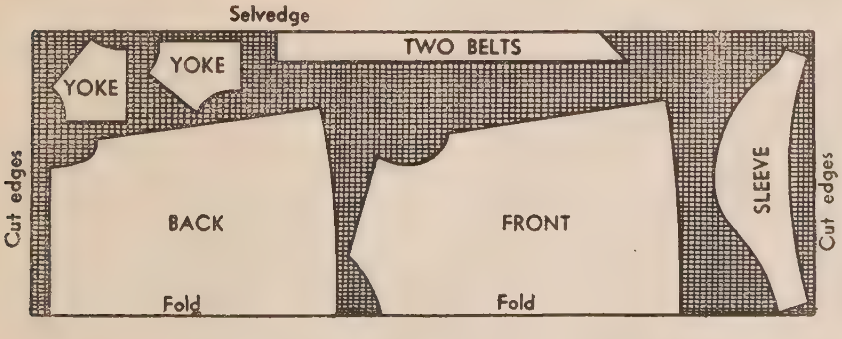
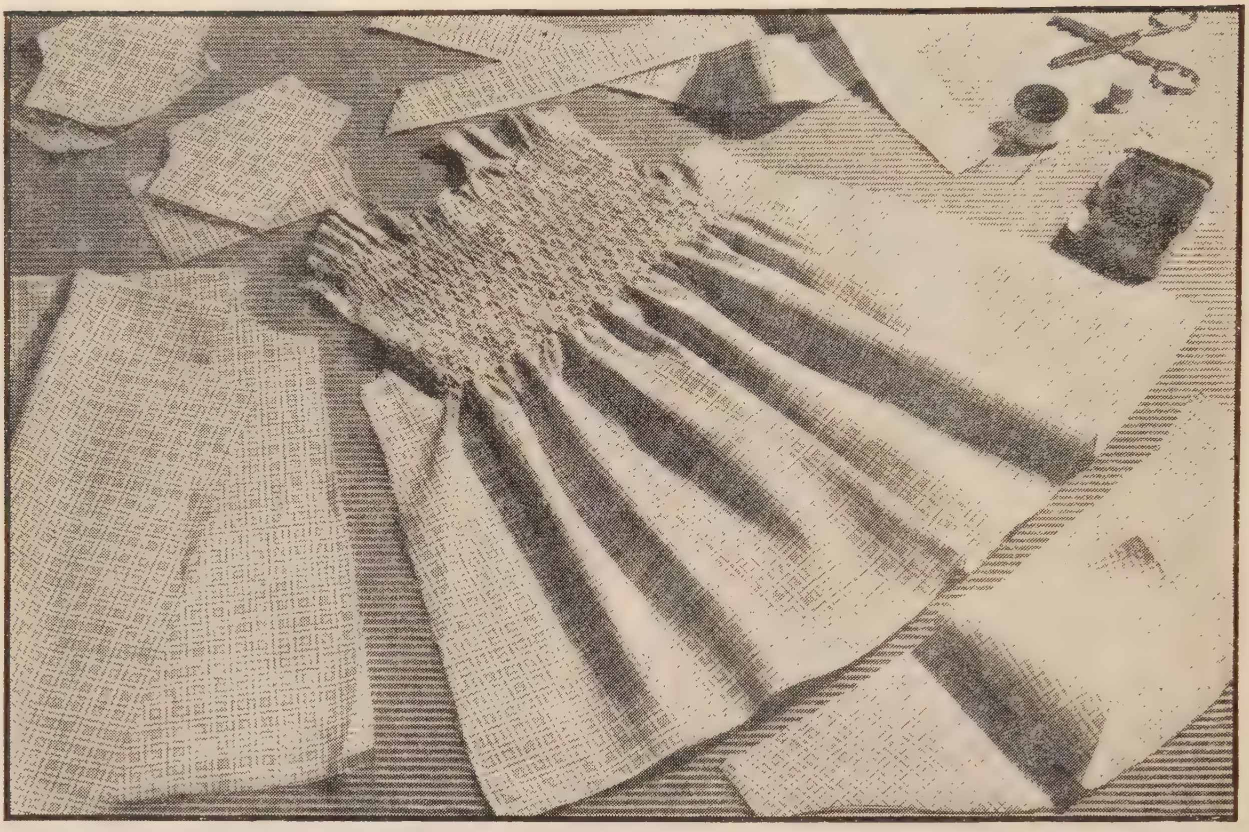


Fig. 7—Layout for pattern pieces on 1⅜yds. of 36in.-wide material.



[*Sparrow Industrial Pictures Ltd. photo.*

The pieces of the frock cut out and the front smocked, ready to be sewn.

This makes one point. Continue to the end of the row and fasten off the thread firmly.

Second Row of Stitching

Start again at the right-hand side of the work on the fifth row of gathers. Take up the first and second pleats of the 5th row and make a back stitch over both.

Take up the second and third pleats of the 4th row and make a back stitch over both.

Take up the third and fourth pleats of the 3rd row and make a back stitch over both.

Take up the fourth and fifth pleats of the 4th row and make a back stitch over both.

Take up the fifth and sixth pleats of the 5th row and make a back stitch over both.

Continue to the end of the row.

These two rows of stitching are repeated until the correct depth of the bodice is reached. Then return to the shoulders and work in the appropriate rows. Gather the neck to fit the paper guide, then remove it and pull out the gathering stitches.

Fig. 8 shows the smocking stitches in detail.

Making up the Frock

Take the back and make narrow hems ⅛in. wide down the back opening, cutting a straight line across at the bottom. Fold the right side over the left to form a pleat and back stitch to form a square of stitches to strengthen the opening. Gather both sides of the top edge, sandwich them between the two yoke pieces, and stitch along the bottom of the yoke and up the two ends at the centre back. Turn the back right side out and press the seams.

Gather the front shoulder edge, set it on to the outside yoke pieces right sides together, and stitch it. Make french seams at the sides. Make a single turning of ½in. on the lower hem to the wrong side and stitch it. Make french seams for the sleeve seams, taking care to make a pair. Make a tiny hem at the lower edge and hem it by hand. Gather the top between the two crosses on the pattern; gather the lower edge between the two crosses and pull up the thread to make the sleeve 7in. round—that is, 3½in. when it is doubled. Tack the gathers evenly on to a piece of narrow tape, turning in the outside end of the tape for a neat finish. Set the sleeves into the armhole, leaving the inner yoke unattached.

Stitch round the outer edges of the collar ½in. in from the edge, trim to ¼in., and snip at the curved corners. Set the collar on to the neckline, making the front opening at the centre, and stitch it on the right side. Trim the seam, press the raw edges down, and tack the inner yoke in place at the shoulders and round the armholes. Cut a narrow crossway piece for the front neckline and hand sew it in place over the raw edges of neck and collar.

Stitch the inner yoke to the shoulder and armhole seams by hand; oversew the lower armhole to give a tidy finish.

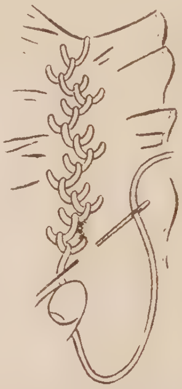


Fig. 9—The double feather stitching at the sleeve hem.

Turn up the hem 2¾in. and hand stitch it to make the hem easier to unpick when it is necessary to lengthen the frock.

Make three buttonholes or loops on the right side of the back yoke and sew buttons in corresponding places on the left side. Hem the belts with ⅛in. turnings and attach them at the lower edges of the smocking.

Work a row of double-sided feather stitching (Fig. 9) over the gathers of the sleeve, taking the stitches right through to the tape, and the little frock is completed.

THE MUSEUMS OF NEW ZEALAND

THE first two articles in this series by Enid B. V. Phillips described the Dominion Museum, Wellington, and the Otago and Canterbury Museums. This month she deals with the founding and growth of the

Auckland War Memorial Museum

THE industry of a young Scottish naval surgeon in employing his leisure hours to study the vegetation of the Cape of Good Hope, where he was stationed, instead of indulging in more frivolous pastimes started the chain of events which culminated in the formation of a museum in one of the fairest cities of the Dominion—Auckland. Dr. Andrew Sinclair's professional skill, combined with his prowess at botany, gave him the ideal qualifications for his appointment to the Sulphur to accompany the Beechey expedition to South America in 1835. Indeed, his botanical contributions from Brazil, Mexico, Central America, and California so added to the success of the trip that the eminent scientist Joseph Hooker named a species in his honour.

He came to New Zealand in 1841, finding it an absolute paradise of plant life. Here he could botanise to his heart's content and the British Museum often benefited from his discoveries. He made one voyage to Tasmania, but he no longer desired to travel to foreign parts, preferring to settle in New Zealand, where he accepted the post of Colonial Secretary. By 1852 his collecting had reached such proportions as to warrant the beginning of a museum locally. With the help of several other kindred spirits a small 4-roomed cottage in Grafton Road was secured for this purpose, and on October 25, 1852, Auckland held its first museum display.

Tragic Ending

Sad to relate, Dr. Sinclair's story had a tragic ending. During the early part of 1861 he joined forces with Julius von Haast to explore the Southern Alps. They had covered quite a lot of territory when Sinclair decided to return to their headquarters at Samuel Butler's station, Mesopotamia, with his specimens before proceeding further into the mountains. While crossing a creek in company with another member of the party he suddenly stumbled and, failing to regain his footing, was whirled downstream by the swift-running waters. His burial took place at Mesopotamia and Haast commemorated his name by calling the 7000ft. peak at the head of Forest Creek after him. Dr. Sinclair's nieces undertook the mounting of his specimens, which were displayed by Sir George Grey at the Dunedin Exhibition of 1865.

With Sinclair's death interest in the Auckland Museum languished, and though Dr. Hochstetter had renovated the collection during his brief stay in 1859, it again fell into neglect until Captain F. W. Hutton's ministrations revived it. In 1867 he supervised the museum's removal to the Provincial Government offices in Princes Street, where the Northern Club now stands. The Auckland Institute (at first called the Auckland Philosophical Society) was founded in November of that year by the Superintendent of the province, Mr. Justice Gillies, and in 1869 the Auckland Provincial Council transferred the museum to the institute and the museum was then moved to the old post office on the corner of Princes Street and Eden Crescent, where it was housed for the next 7 years.

The botanist Thomas Kirk acted as secretary and curator until 1874, the museum being open thrice weekly. His successor, Thomas Frederick Cheeseman, was also a botanist and it is indicative of the happy relationship between the two men that in years to come Cheeseman completed the major work "Flora of the Outlying Islands," which Kirk, who had been chief conservator of State Forests since 1885, was engaged upon before his death. (The beautifully fitted, bronze-handled writing-case with its ingenious locking device and pin to hold the drawer in position, a wedding gift to Thomas Kirk from his workmates in England; the cleverly partitioned mahogany chest, marked Cabin 10 and monogrammed with the initials T.K., which Mrs. Kirk had made to hold the baby's clothes on the 5-months voyage to New Zealand aboard the Gertrude in 1863, and which was later used by her husband on his travels through the colony and the outlying islands; and his large armchair with its comfortably upholstered curves, slender, scroll-shaped legs and acanthus-carved headpiece are greatly treasured by his descendants who reside at Wadestown, Wellington.)

[*Sparrow Industrial Pictures Ltd. photo.*

The imposing facade of the Auckland War Memorial Museum, which is situated in the Auckland Domain.

Bent for Botany

Thomas Cheeseman, son of a Yorkshire minister, was born at Hull, England, but came to New Zealand with his parents at the age of 7. He had always shown a bent for botany and even the ship which brought him to New Zealand bore a botanical name, Artemesia, a genus of the daisy family. The first thing he did on being rowed ashore after the Artemesia dropped anchor in Waitemata Harbour was to climb up a huge tree fern, to the detriment of his Eton suit, and cut off one of the large curling fronds, carrying off his first specimen of New Zealand flora in triumph to his new home.

Auckland acclaims him as her own son, for he was educated there, and during his holiday rambles through the countryside he became so familiar with the vegetation of the locality that soon after his college days he published an account of the plant life of the Waitakere hills, a most important paper, as it is the sole record of a vegetation "now profoundly modified."

In those early days the institute had only 90 members and its total income was just over £90 a year, which had to cover the curator's salary as well as museum expenses and purchases, so the magnitude of the task confronting Cheeseman can be appreciated. Fortunately, his entire family shared his enthusiasm for the museum and did all they could to help him. When he was engaged in duties for the Acclimatisation Society on Sundays his father substituted for him at the museum. His brother Willie betook himself on shooting expeditions to secure additional specimens of birds, and his eldest sister Emma tried her hand at taxidermy with commendable results. Another sister, Nellie, had a talent for sketching which she turned to good account on behalf of the museum, as witness her lovely little drawings of shells, while Clara, the youngest of the family, acted as his secretary for many years—"My amanuensis," as he affectionately called her.

His own diligence and enthusiasm so kindled public interest in the museum that within a year he had persuaded his fellow-citizens to subscribe over £2000 toward the cost of a new brick building on the Princes Street site, the second story being used as an art gallery and library, the opening ceremony being performed on June 5, 1876, by the Marquis of Normanby.

Funds from Conversaziones

As finances improved Cheeseman was able to avail himself of the services of the Austrian Andreas Reischek as taxidermist. In an account of an early conversazione held at the museum it is reported that Reischek prepared a group of birds and animals especially for the occasion. He also did much collecting at Kawau. These conversaziones continued to be a regular feature and provided the funds for new showcases and other needs of the museum.

In 1884 the museum purchased the section next door, this land being used for the extension of the building in 1892. An amusing contretemps occurred in connection with the erection of this extension, a special section being set aside to shelter the large Maori war canoe Te Toki-a-tapiri. Unluckily, however, the canoe proved too big to go through the doorway, so that part of the wall had to be pulled down and rebuilt to accommodate the enormous canoe, over 82ft. long and the only one of such size to be preserved intact. According to Archdeacon H. H. Williams, the chief Waaka Peruhaka, who lived near Kaupapa, was at one time owner of this canoe, presenting it to the noted Ngapuhi chief Tamata Waaka Nene. The latter returned the compliment by giving him a piebald stallion called Taika (Tiger), probably the first in the Poverty Bay district, and Peruhaka is also credited with introducing the first parcel of wheat in the district.

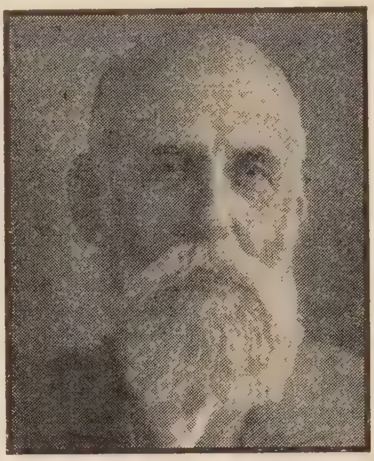
The property adjoining the museum at the back belonged to a Mr. Keesing, whose trio of little dark-haired daughters frequently preferred the museum to their own spacious garden as a playground and sometimes had to be gently shooed homewards when their games became too noisy for the prevailing silence of those sacred precincts.

Years later the middle one, Rose, whose face was as lovely as the flower after which she was named, became the curator's bride, and for their wedding trip they went on the steamer Hinemoa, with Captain Fairchild, to the Three Kings on a botanical expedition. In order to land on one of the islands the dainty little bride had the unenviable experience of having to jump from the ship to the shore at a given signal; the slightest mistake in timing and she would have been crushed between the boat and the rocks. Nevertheless, she came through the ordeal safely like the courageous woman she was, and there was no untoward incident to mar the idyllic happiness of their excursion together.

Plant Collecting in Southern Alps

In January of the following year they had a second honeymoon, this time collecting plants in the Southern Alps region. Rose Cheeseman also accompanied her husband on his trip to Polynesia, his survey of the flora of Rarotonga being published by the Royal Linnean Society, a signal honour.

Thomas Cheeseman invariably made the trip to the museum each day on horseback and he habitually carried a black leather bag slung over his back. So regular was his time of arrival each morning that the wife of a well-known newspaper proprietor who lived along the route used to exclaim to her daughter: "See if the clock's right! Here comes Mr. Cheeseman."



T. F. Cheeseman, curator of the Auckland Institute and Museum for half a century.

He always took this bag on his collecting expeditions, and if he intended to be away overnight, he saw that it contained a supply of absorbent paper suitable for pressing specimens between. On a calm day it was quite a customary sight to see dozens of sheets of specimens spread out to dry on the sunny balcony of the Cheeseman home.

The walls of his study were lined with bookshelves and beautifully grained cupboards of heart kauri specially designed to hold his herbarium. Particular as he was over his specimens and papers, he had no care whatsoever for his clothes, and many a time he came home with his suit ripped to ribbons after climbing cliffs to reach some rare flower or fern or fossicking in caves in search of Maori curios.

Although Cheeseman was pre-eminent as a botanist, he was interested in all the sciences, and out of his 101 papers and books 22 were concerned with zoology and ethnology. Moreover, he was meteorological observer at Auckland for 32 years and as a young man assisted his father in the formation of an astronomical society and was also the mainstay of the Acclimatisation Society. He was an authority, too, on Maori art and history and he built up a unique collection relating to the customs, manners, and mode of life of the Maori race.

When the Duke and Duchess of Cornwall and York (King George V and Queen Mary) visited New Zealand in 1901 they specially requested the Auckland Museum to be included in their itinerary, and Their Royal Highnesses were so keenly interested in all Thomas Cheeseman showed them and the fascinating stories he recounted concerning the various items in the Maori collection that they overstayed their time and even then were reluctant to depart.

Te Rangihiroa, Dr. (Sir) Peter Buck, had a good deal to do with the collection in its infancy and when this distinguished anthropologist, whose researches in the Pacific, at Yale University, and at the Bishop Museum, Honolulu (of which he is Director) have earned him world fame, returned to the land of his birth a few months ago and saw the growth of the Auckland Museum's Maori collection in the last 22 years he declared it to be the finest in existence.

Generous Subscriptions

The citizens of Auckland were quick to realise that "a good curator makes a good museum" and based their generosity accordingly, on numerous occasions subscribing the funds needed for such purchases as the Mair Maori collection, the Spencer collection of Maori carvings, the carved pataka and the celebrated runanga house, "Rangitihi." The bequest from Edward Costley (who lived frugally and left a fortune) provided the museum with a permanent income. E. A. Mackechnie's bequest built up the museum library, which was further augmented by the gift of 500 scientific volumes each from G. F. Edmonstone and J. T. Mackelvie. The latter's mining ventures at Thames proved so successful that he founded the Mackelvie Trust, under which valuable art collections were presented to the city. Sir John Logan Campbell, "the father of Auckland," was another generous donor, and, indeed, a complete list of benefactions over the years would cover pages and pages even in fine print.

Cheeseman's work on the cross-fertilisation of orchids attracted the attention of that great scientist Charles Darwin, who corresponded with him on the subject, these letters now being in the museum. In 1906 the Government published Cheeseman's monumental work, "The Manual of the New Zealand Flora," but always the botanist's chief concern was the development of his beloved museum. Many of the books sent to him personally by overseas scientists enriched the museum library and he carried on a correspondence with curators of foreign museums, for though he could not speak their language, yet with the aid of a dictionary he was able to compose suitable epistles in their own tongue, and if there was nobody at hand to translate the reply for him, he undertook the task himself, once more turning to a trusty dictionary for assistance.

All manner of valuable exchanges and additions to the collections were effected by this means, but lest it be thought his life was all work and no relaxation, it should be mentioned that he derived great joy from his garden and his stamp collection. He also loved to play chess and spent many a

Saturday evening in a keenly contested game with his friend Captain Herold. Sir George Grey was another of his close friends and bequeathed his extensive Maori collection to the city.

Proverbial Patience

No matter how busy he was (and seldom a year passed without an important publication appearing from his pen) he was never too preoccupied to play with his children, and whenever his young son or daughter appeared in the doorway of his book-lined study he would put down his work and, swinging round in his chair to face them, greet them genially: "What can I do for you, Master (or Miss) Cheeseman!" And always he found time for long walks with his family on Sunday afternoons, which incidentally served to increase their knowledge of nature study, his patience with their endless questioning being proverbial. It was characteristic of Cheeseman that he took just as much trouble to answer a child's query as that of the most eminent scientist.

In 1917 he published his jubilee sketch outlining the history of the first 50 years of the Auckland Institute and Museum and citing its future aims. Largely as a result of his far-sighted advice steps were taken to secure a site for a new and larger museum on Observatory Hill, in the Auckland Domain, the Princes Street building being totally unsuited to further additions. By 1920 the institute had collected over £52,000 for this purpose and when it was decided that the proposed museum should be a memorial to the men of the province who gave their lives in the First World War a citizens' committee was set up and further sums collected, the subscriptions amounting to nearly £1 per head of the population. Competitive designs for the building were called for, and 600 were received, 23 coming from Great Britain. It was surely a happy coincidence that the winning design for this war memorial museum was the work of three young returned soldiers, Messrs. Grierson, Aimer, and Draffin, of Auckland.

Mr. Cheeseman was a familiar sight to Aucklanders as he rode on horseback to the museum each day. He is shown here outside his home, "Marunui," Remuera, with his daughter.

The edifice, which covers almost an acre, was begun in 1925 and took 4 years to complete, with the result that Auckland today has a museum building which vies with Cardiff, Belfast, Saint John, N.B., and half a dozen others for the proud title of the Empire's most beautiful museum, to quote the words of S. F. Markham, M.A., B.Litt., at the Norwich Conference, Mr. Markham having spent 7 years visiting nearly every important museum in the British Empire. (Mr. Markham, in collaboration with Dr. H. C. Richards, compiled "A Directory of the Museums and Art Galleries in Australia and New Zealand," which was published by the Museums Association, London.) Furthermore, he stated that Mr. Cheeseman's efforts constituted the most inspiring record of what one man could do that had ever happened in the museum field.

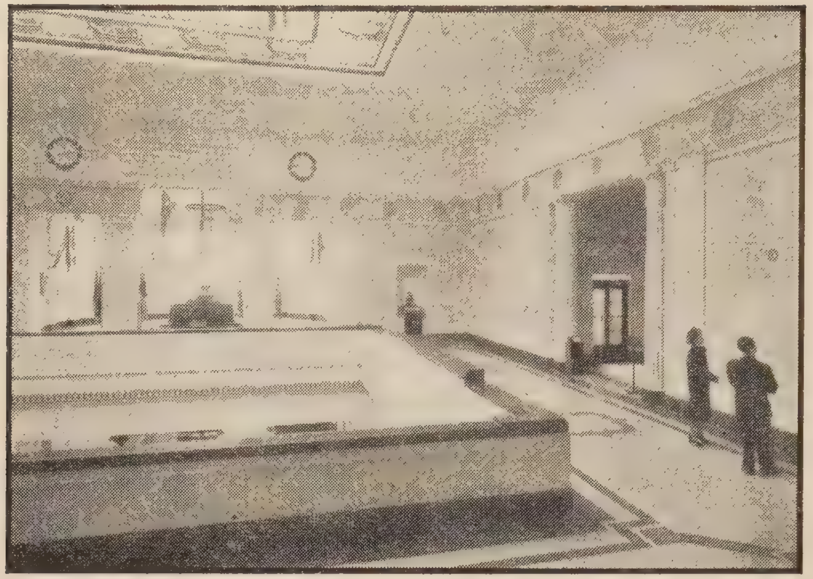
Greek Architecture

The architecture follows the Greek order, the facade and front colonnade being of Doric design, and the lofty pillars of the Hypostyle Hall are Ionic, forming a dignified approach to the central Hall of Memories with its high dome roofed with stained glass in glowing jewel colours and its walls inscribed with the names of over 7000 soldiers, sailors, and airmen of Auckland Province who made the supreme sacrifice in the First World War. Beyond the Hall of Memories is the Apsidal Chapel, which contains a shrine of black marble.

At the ceremonial opening on November 28, 1929, the Governor-General, Sir Charles Fergusson, referred to the impressive ceremony for those who died in battle in ancient Greece, a simple commemoration of duty faithfully done, and urged that the sacrifice of our fallen be a call to duty for the living. The doors were opened in response to His Excellency's knocking with a carved mere and the official party then entered the building, followed by the next-of-kin of the fallen and later by returned servicemen and relatives.

Next day the Maori chiefs and their tribesfolk assembled from all parts of the province for the tomo, the dedication ceremony of the large Ngati-maru meeting-house named after their leading ancestor, Hotunui, to whom it once belonged, Their Excellencies being the first to enter the meeting-house after the traditional ceremony had been performed by Tutanekai Taua.

The Auckland Institute and Museum, which was opened in 1876 by the Marquis of Normanby.



[*Sparrow Industrial Pictures Ltd. photo.*

On the walls of the Hall of Memories of the Auckland Museum are inscribed the names of more than 7000 servicemen from Auckland Province who died in the First World War.

It is regrettable that Thomas Cheeseman did not live to see his "labours materialised." He died on October 15, 1923, but he had practically completed that other part of his lifework, the revised edition of "The Manual of the New Zealand Flora," and the year before his death he was awarded the Gold Medal, the highest honour possible for the Royal Linnean Society to bestow, and a few months later his fellow-citizens presented him with an illuminated address and a purse of sovereigns in recognition of his 50 years' service with the Auckland Institute.

An Immensely Valuable Gift

However, the natural history hall in the museum is known as the Cheeseman Memorial Hall and there can be seen a bas-relief of the noted botanist executed by the sculptor R. O. Gross, of Auckland. Cheeseman left his large herbarium of native and exotic plants to the museum, including almost a complete set of plants collected by Banks and Solander during Captain Cook's voyages of 1769-1770—an immensely valuable gift both from a historical and scientific point of view. Also, post-primary pupils compete annually for the Cheeseman Memorial Prize, six prizes being given yearly since 1932 for essays, collections, poems, displays, or projects, and his memory is further perpetuated by a flower show every spring, when schoolchildren from all over New Zealand send exhibits of native flora for display at the museum, some of the entries even coming from as far south as Stewart Island. Boys' and girls' clubs meet regularly for the study of botany, ethnology, and natural history, and there is also a sketch club.

The museum is steadily increasing the scope of its activities, this being largely due to the ability and administrative gifts of Dr. Gilbert Archey, O.B.E., who has been Director of the museum since 1924. A zoologist as well as an anthropologist, Dr. Archey's monograph "The Moa," based on years of study and research (involving investigation of moa bone deposits in the King Country near Te Kuiti in company with three other members of the Museum Council, Sir Carrick Robertson, Sir Frank Mappin, and A. T. Pycroft, the party being lowered into the limestone caves by means of ropes) made scientific history. His "Notes on Sub-fossil Bird Remains" is another important contribution, likewise "Wood Carving in the North Auckland Area," "Maori Carvings in the Three Kings," and "South Sea Folk," a handbook of Maori and South Pacific ethnology.

Shortly before the end of the war the military authorities granted him a special leave of 9 months to take charge of the Raffles Museum in Singapore, and he travelled extensively in Malaya, gathering together the treasures which the natives had succeeded in hiding from the enemy, and putting the museum in order pending the arrival of a director from England.

Research and Display Work

The scientific staff is constantly engaged in research and display work (for example, the Assistant Director, A. W. B. Powell, whose handbook "The Native Animals of New Zealand" is having phenomenal sales, was awarded the Hector Medal last year for his numerous papers on fossils and mollusca) and these activities have been greatly helped by the benefactions of Edward Earle Vaile, whose endowments of property bring in an income which enables the museum to buy extensive ethnological collections and books relating to New Zealand and the Pacific. The latest purchase of this kind is the notable library of rare and historical works of early New Zealand and Maori life (many with handwritten notes from the authors) of Johannes C. Andersen, M.B.E., who until his retirement was Librarian of the Alexander Turnbull Library, Wellington.

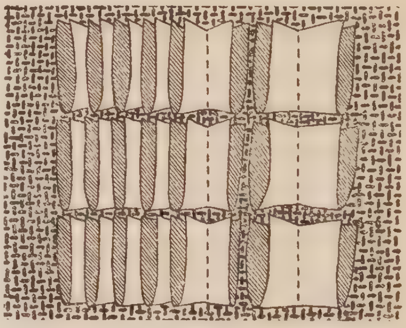
Instituted in 1931, Sunday afternoon lectures, comprising a course of 6 to 16 lectures illustrated by lantern slides or films, are most popular with the public, and hardly a year passes without one or more special exhibitions being held, the museum issuing a handbook in conjunction with many of these exhibitions.

MAKING RAG RUGS FROM RAGS AND SACKS

MAKING a rag rug according to the instructions given on page 298 of the September "Journal" has shown that variations in the method may facilitate the work in some cases.

The directions given stated: "A square of the appropriate colour is folded in halves, put under the machine foot fold foremost, and stitched through its centre to the sack." Sewing with the fold toward the worker may be found easier. The placing of the folded edge is a matter of personal convenience and depends to some extent on the type of machine foot. The tension should be loosened and the stitch lengthened. If possible, the ordinary machine foot should be replaced with a cording foot. Each square should be sewn on with the raw edges close to the fold of the previous piece.

When working to a design, stitching in rows across the width of the rug seems easier and quicker than the recommended method of working right round the rug, as it simplifies filling in the centre. This means that several colours are being worked at once, and more squares must be cut first, but if each colour is placed in a small box, they are easily kept at hand.



The method of folding and stitching the squares to the sacking. The two rows on the right are shown wider apart than they would be in practice.

Making a small sample before the rug is begun enables the method of working to be adapted to the requirements of the pattern and the machine.

—*EVA TOPPING, Rural Sociologist, Department of Agriculture, Auckland.*

Strawberries are ripe again

STRAWBERRIES are perhaps the most delicious of all the soft fruits of summer. Though the simplest and probably the most enjoyable way to eat them is to pick them, sun warmed and juicy, straight from the plant, there are many other delightful ways of serving them, some of which are described in this article by Eva Topping, Rural Sociologist, Department of Agriculture, Auckland.

WHERE strawberries are plentiful the fragrant smell of hot strawberry jam will pervade the kitchen, and perhaps a few can be spared to bottle in small jars

Strawberry Jam

Strawberries are among the fruits which do not set readily in jam making, and the addition of some acid and pectin is required when only strawberries are used. By combining them with apple, rhubarb, plum, gooseberry, or lemon juice, a good setting jam will be obtained. Strawberry jam is much better made in comparatively-small quantities, perhaps 2 or 3lb. of fruit in a boiling.

The first recipe gives a jam with a good proportion of whole strawberries in it. Though rhubarb juice is specified, plums, apples, or gooseberries can be used instead. For making the juice boil the apples and cut them in pieces with skins and cores included.

Recipe 1

2lb. of rhubarb
2lb. of strawberries
2 cups of water
About 3½ cups of sugar

Wash the rhubarb, cut it into 1in. pieces, add the water, and boil the rhubarb until it is pulpy. Strain it, measure the juice, and allow the same quantity of sugar. (There should be at least 2 cups of juice; if there is less, make it up to 2 cups with water.) Put the measured sugar, rhubarb juice, and another 1½lb. of sugar into a preserving pan and stir it over a gentle heat until the sugar is dissolved and the juice is almost boiling. Then add the strawberries and boil the jam rapidly, stirring as little as possible to keep the strawberries whole. Skim off the scum, test for setting, and when setting point is reached remove the pan from the stove. Take off any scum and leave the jam to cool, stirring or shaking the pan gently occasionally to prevent the strawberries floating when the jam is in the jars. Pour the jam into clean pots, leave them until they are quite cold, pour on melted wax, and cover, label, and store them.

Recipe 2

3lb. of strawberries
3lb. of sugar
Juice of 3 lemons

Wash and stem the strawberries, put the sugar over them, and leave them to stand for 2 or 3 hours, or overnight if convenient. Pour them into a preserving pan, add the lemon juice, and heat them slowly to boiling point, stirring gently until the sugar is dissolved. Boil the jam rapidly until it sets when tested (from 15 to 25 minutes). Put it up and cover it when it is cold.

If the jam is covered with paraffin wax, there should be a small space between the top of the wax and the cover.

Bottled Strawberries

A few small jars of preserved strawberries are a splendid addition to the store cupboard. They can be used for special-occasion cakes, fruit salads, or other desserts. Pint-sized preserving jars are practically unobtainable at present, but 1lb. jam jars sealed with preserving skin are convenient containers. If the first recipe and method are used, the berries remain whole and are less likely to float to the tops of the jars. Unfortunately, strawberries often lose some colour in the bottling processes.

Recipe 1

1 cup of sugar
2lb. of whole strawberries
½ cup of strawberry juice

Crush and heat enough strawberries to yield ½ cup of juice; over-large, damaged, or misshapen strawberries can be used for this. Add the sugar to the juice, boil and cool it, add the whole strawberries, and boil them for 3

Heading photograph by Sparrow Industrial Pictures Ltd.

three flowers

FACE POWDER

Here's a face powder that's made lighter, finer, won't streak or "cake". . . a powder that clings, wears longer. It makes your complexion younger-looking — enhances your loveliness — gives your complexion the flattery it deserves. Try the New Three Flowers Face Powder today . . . in the newest shades to suit your type of beauty. Complete your make-up, too, with smooth textured Three Flowers Lipstick and Rouge.

To enhance your loveliness

CREATIONS OF Richard Hudnut NEW YORK · LONDON · PARIS

Prepared by Richard Hudnut Ltd., 21 Federal St., Auckland

TF2/49

minutes. Cover the saucepan and set it aside for at least 4 hours or over night. Pack the strawberries into clean jars, filling them to within 1in. of the top. Scald the sealing skin and tie it tightly over the jars. Set them in a vessel of water, having at least 1in. of water over the tops of the jars, bring the water to the boil, and maintain it at boiling point for 10 minutes. (Detailed instructions for using skin seals were published in the "Journal" for November, 1948.)

Recipe 2

Select firm, well-coloured strawberries, and stem and weigh them. For every 1lb. of berries allow ¾ cup of sugar. Cover the strawberries with the sugar and stand them overnight, or for several hours at least. Put them into a pan, bring them to the boil, and let them boil rapidly for 10 minutes, removing scum as it forms. Pack the strawberries boiling hot into sterilised jars and seal them at once. Fill and cover one jar at a time, having the jars thoroughly sterilised and scalding the skin just before tying it on the jar.

Strawberry Desserts

Strawberries can be used in a variety of ways to make desserts fit to grace any occasion. Here are some recipes:

Strawberry Pie

1 pastry shell
1 dessertspoon of cornflour
About 1lb. of strawberries
1 dessertspoon of sugar

Make a pie shell of short crust pastry and leave it to cool. Wash and stalk the strawberries and set half aside, choosing even-sized fruit. Mash the other half, add ½ cup of water, and heat them slowly to boiling point. Strain them through a sieve, measure the juice, and make it up to 1 cup with extra water if necessary. Bring the juice to the boil again and add the sugar and cornflour, ready blended to a smooth paste with a little cold water. Cook the mixture, stirring constantly, until it is transparent.

Cut the whole strawberries in halves lengthwise and cover the bottom of the pie shell with them, reserving some berries for garnishing. Pour the prepared glaze over them and set the pie aside until it is cold. Decorate it with whirls of sweetened mock cream, with a berry in each.

Strawberries in Jelly

2 tablespoons of gelatine
½ pint of strained lemon juice
½ pint of water
1 to 2 tablespoons of sugar

Soften the gelatine in 2 tablespoons of cold water; boil the remainder of the water and pour it over the gelatine. Stir in the sugar and lemon juice. Rinse a basin or mould in cold water, pour in a little lemon jelly, and put it aside in a cool place until it is set slightly; keep the rest of the jelly warm. Arrange a layer of hulled, washed, and dried strawberries on the semi-set jelly, pour over more jelly, and leave it to set again. Repeat the layers of jelly and berries until the mould is filled. Reserve some of the strawberries for garnishing the jelly when it is ready to send to the table.

STRAWBERRY PIE

[*Sparrow Industrial Pictures Ltd. photo.*

Strawberry and Ice Cream Shortcake

1¼ cups of flour
2 flat teaspoons of baking powder
½ cup of milk
Salt
¾ cup of sugar
1/3 cup of butter
1 egg

Sift the flour, baking powder, sugar, and salt, rub in the butter, add the milk, and beat the mixture well. Add the egg and beat again. Spread it in a greased and floured tin and bake it for 25 to 30 minutes in a moderately-hot oven (375 degrees). Cool the cake, split it in halves, and spread the lower half with vanilla ice cream and sliced strawberries. Put the other half on top and cover it generously with halved strawberries sprinkled with icing sugar.

Strawberry Fluff Sauce

2 teacups of small strawberries
1 teaspoon of lemon juice
Pinch of salt
½ teacup of icing sugar
1 egg white

Mash the fruit well, then add the lemon juice and sugar. Beat the egg white with the salt until it is stiff, add the fruit puree, and whip the sauce until it is light and fluffy. Use it at once with vanilla-flavoured junket, ice cream, blancmange, spanish cream, or similar desserts.

JELLIED STRAWBERRIES

[*Sparrow Industrial Pictures Ltd. photo.*

Strawberry Ice Cream (1)

2/3 cup of sweetened condensed milk
1 cup of crushed strawberries
1 cup of unsweetened mock cream
1/3 cup of water
¼ cup of sugar

Mix the condensed milk and water and add the strawberries and sugar. Pour them into a freezing tray and place them in a refrigerator set at its lowest point. Chill them, then add the cream, mixing well. Cool the mixture rapidly until it is half frozen, scrape it into a basin, and beat it hard until it is smooth but not melted. Replace it in the refrigerator, and repeat the beating once more before the ice cream is completely frozen.

Strawberry Ice Cream (2)

1 pint of milk
2 eggs
2 teaspoons of gelatine
Pinch of salt
1 dessertspoon of cornflour
2 tablespoons of sugar
1 cup of crushed strawberries

Make a custard with the egg yolks, cornflour, and sugar. Dissolve the gelatine in a little cold water and add it to the custard, mixing thoroughly. Pour it into the freezing tray and leave it until it is nearly frozen. Whip the egg whites with the salt until they are stiff. Crush the strawberries. Beat the custard, add the pulped fruit, then fold in the egg whites. Put the ice cream back into a refrigerator until it is frozen.

Strawberry Roll

4 eggs, separated
½ teaspoon of vanilla essence
Pinch of salt
¼ cup of sugar
¾ cup of flour
1 teaspoon of baking powder
1 cup of sweetened mock cream for filling

Beat the yolks until they are pale and add the sugar gradually while continuing to beat. Whisk the whites until they are stiff, fold in the yolk mixture, and add the vanilla essence.

STRAWBERRY RECIPES

STRAWBERRY MERINGUE CAKE

[*Sparrow Industrial Pictures Ltd. photo.*

Fold in the sifted flour, baking powder, and salt. Spread the mixture evenly in a swiss roll tin lined with wax paper. Bake the cake in a moderately-hot oven (375 degrees) for about 12 minutes or until it springs back when pressed gently with the finger tip.

Loosen the edges and turn the cake out on to a cloth sprinkled with icing sugar. Peel off the paper quickly but carefully. If the edges of the cake are crisp, trim them off with a sharp knife or it will not roll without cracking. Lay a fresh sheet of waxed paper on the cake while it is warm and roll it up. Wrap it in a tea towel and leave it on a cake rack until it is cool, then unroll it and remove the paper.

Whip the cream, spread some of it on the roll, and cover it with sliced strawberries. Roll it up again and cover the top with the remainder of the cream and strawberry halves.

Strawberry Toasts

For supper on a summer evening try these sweet toast titbits:

4 thick slices of bread
Small strawberries
Butter
Sugar
Cinnamon

Toast the bread lightly on one side only. Spread the other side with butter, sprinkle it with sugar and a dusting of cinnamon, and toast it lightly. Cover this side with strawberries, dot it with butter, sprinkle it with sugar, and toast or bake it lightly until the berries are hot

Strawberry Tarts

1 cup of flour
4 to 5 tablespoons of mock cream
3 tablespoons of butter or lard
Pinch of salt

Sift the flour and salt, add the fat, and cut it in with two knives until it is very fine. Mix in just sufficient top milk or mock cream to make a very firm paste. Roll the mixture into a ball and leave it to stand for about 5 minutes to make it easier to roll. Roll it out on a lightly-floured board to ⅛in. thick and cut it into 4in. rounds. Put them on an ungreased baking sheet, prick them with a fork so that they do not puff up, and bake them in a very hot oven (475 degrees) for about 7 minutes—until they are lightly coloured.

Cool them, and cover them with whipped cream, leaving a rim of pastry showing, then with unsweetened, hulled strawberries. With a spoon pour over sieved apricot jam, thinned with a little hot water and cooled. Red currant, gooseberry, or apple jelly may be used instead of apricot jam.

Strawberry Meringue Cake

Cake Base:
1 cup of flour
2 flat teaspoons of baking powder
½ cup of milk
Few drops of vanilla essence
Few drops of lemon essence
2/3 cup of sugar
3 tablespoons of butter
2 egg yolks

Meringue Top:
2 egg whites
½ cup of sugar
1 flat teaspoon of baking powder

Sift the dry cake ingredients, rub in the butter, add half the milk and the flavourings, and beat them thoroughly for 2 minutes. Add the rest of the milk and the egg yolks, and beat the mixture for another 2 minutes. Pour it into a greased and floured tin of 9in. diameter, and pile on top the meringue mixture, made by beating the 2 egg whites until they are stiff, adding ½ cup of sugar while still beating, and folding in 1 flat teaspoon of baking powder. Leave peaks round the edges and a hollow in the centre.

Bake the cake for forty minutes in a moderate oven (350 degrees), cool it in the tin for 10 minutes, loosen the edges, turn it out on to the hand, and place it right side up on a wire rack to finish cooling. Fill the hollow with sweetened, hulled strawberries reserving some choice berries for decorating the plate.

Recipe for Mock Cream

1 12oz. tin of unsweetened condensed milk
Flavouring
1 dessertspoon of gelatine
About 3 tablespoons of icing sugar

Soak the gelatine in a tablespoon of cold water, pour over it ¼ cup of boiling water, and set it aside to cool. Pour the milk into a large basin and whip it with an egg beater until it is thick. Add the gelatine mixture slowly while continuing the beating, then add the sugar gradually until the required sweetness is obtained.

STRAWBERRY ROLL

[*Sparrow Industrial Pictures Ltd. photo.*

The New Zealand Journal of Agriculture

Volume 79, July-December, 1949

INDEX

July 1-96, August 97-192, September 193-304, October 305-416, November 417-528, December 529-624.

A
Aldridge, C. G.—Harvesting and Marketing Cut flowers, 555.
Alfa Continuous Buttermaking Process, 17.
Anderson, J. O.—Tree Surgery, 41.
Animal Foods, Fruit, and Vegetables, Nutritive Value of, 185.
Arthur, H. A.—A Pure and Permanent Water Supply, 206.
Ashburton Pasture Competition 1948, 45.

B
Bailey, F. L.—Meyer Lemon Culture, 245.
Baling Wire Straightener, 433.
Ballinger, C. E.—Rotational Grazing in Calf Rearing, 371.
Barnett, M. J.—Flower Garden Notes, 93, 177, 301, 387, 495, 597.
Barns, Weatherproof, for Baled Hay, 363.
Batt, W. G.—Farm Dairy Instruction:
  Care of Milk and Cream, 213.
  Cleaning Milking Machines and Dairy Equipment, 487.
  Its Relation to Milk and Cream Grading, 73.
  Quality Faults, 105.
Bee Diseases in New Zealand, 483.
Beef Cattle, Waikato, Championship, 119.
Bee Stocks in New Zealand, Improvement of, 553.
Beeswax Salvaged with Hydraulic Press, 163.
Beggs, J. P.—Seed Production in New Zealand: Subterranean Clover, 157.
Bledisloe Trophy, 20.
Boar, Selection and Management of, 273.
Bobby, F. C., and Howse, A. C.—Scheme for Elimination of Pullorum Disease from Poultry Flocks, 353.
Bobby, F. C.—Poultry Breeding, 123, 205, 547.
Britain, Food Supplies for, 212.
Brown, I. L.—Fruit Growing in the Waikato, 317.
Bullock, Heavy, 482.
Butterfat Production (estimated) 1948-49, 336.

C
Calder Swede, 117.
Calf Rearing, Rotational Grazing in, 371.
Calves, Feeding and Rearing of, 125.
Canterbury Pastures, Improving Standard of, 69.
Cederman, J. A.—Hydraulically-operated Glasshouse Ventilators, 583.
Cereals and Dairy Products, Nutritive Value of, 82.
Child Welfare, 79, 189, 283, 395, 397, 513, 603.
Choko Culture, 373.
Claridge, J. H.—
  Calder: A New Variety of Swede, 117.
  Seed Production in New Zealand: Grass and Clover Seed Certification, 533.
  Types of Rape, 77.
Clark, V. R., and Coop, I. E.—Fat-lamb Crosses in Canterbury, 222.
Clover and Grass Seed Certification, 533.
Clovers and Phosphate, 271.
Concrete for Structural Use, Preparation of, 449.
Concrete, Use of Reinforcing and Boxing in Preparing, 571.
Connell, R. P., Obituary, 30.
Conway, T.—Outstanding Sturmer Apple Tree, 270.
Coop, I. E., and Clark, V. R.—Fat-lamb Crosses in Canterbury, 222.
Country Girls' Clubs' Conference, 499.
Cowen, S. J.—Testing Market Milk for Keeping Quality, 241.
Crawford, W. G.—Lettuce Culture, 237.
Crawford, W., Obituary, 224.
Crop and Pasture Competitions, 167.
Crosbie, C. J.—Farm Machinery Dangers, 576.
Cumber, R. A.—Green Vegetable Bug, 563.
Cunningham, I. J.—Bullock Teams in Maori Agriculture, 236.

D
Dairy Produce Graded for Export, May, 24; June, 172; July, 276; August, 324; September, 444; October, 544.
Dairy Products and Cereals, Nutritive Value of, 82.
Danthonia Hills of Hawkes Bay, Farming on, 551.
Dicker, L. B.—Layout and Organisation of Packing Shed, 5.
Domestic Beekeeping Notes, 277, 385, 494, 595.
Drain Tiles, Quality in, 24.
Du Fresne, H. A.—Windmill Used to Remove Milking Shed Waste, 164.

E
Ebert, A. J.—Home-made Potato Bagger, 585.
Eggers, H. W. T.—Concrete:
  Preparation for Structural Use, 449.
  Use of Reinforcing and Boxing, 571.
Electric Fence for Feeding off Saved Pastures, 545.

F
FAO, New Zealand's Annual Report to, 195.
Farm Dairy Instruction:
  Care of Milk and Cream, 213.
  Cleaning Milking Machines and Dairy Equipment, 487.
  Relationship to Milk and Cream Grading, 73
  Quality Faults, 105.
Farming in New Zealand:
  Land Improvement, 421.
  Malvern County, 337.
  Southland, 137.
  Westland, 255.
Farm Production Drive, Review of, by Mr. F. P. Walsh, 445.
Fastenings on Garments, Sewing, 287.
Fat-lamb Crosses in Canterbury, 222.
Fat-lamb Crosses, North Island, 219.
Fertilisers, Controls Removed from Sale of, 3.
Filmer, J. F.—Penicillin for Controlling Mastitis, 134.
Film Review: "Tribute to Achievement," 500.
Flock House Training, 448.
Flower Garden Notes, 93, 177, 301, 387, 495, 597.
Flowers, Harvesting and Marketing Cút, 555.
Foods, Quick-frozen, 86.
Foods, Nutritive Value of Less-important, 291.
Food Supplies, World, 1948-49, 307.
Frew, S.—Weeding and Cultivation Pay, 20.
Fruit, Animal Foods, and Vegetables, Nutritive Value of, 185.
Fruit Growing in the Waikato, 317.
Frying, Deep-fat, 89.

G
Galpin, A. J.—Quality in Drain Tiles, 24.
Gillard, S. O.—
  Choko Culture, 373.
  Home Garden Notes, 197, 327, 439, 539.
Glasshouse Ventilators, Hydraulically-operated, 583.
Goddard, R.—Domestic Beekeeping Notes, 277, 385, 494, 595.
Graham, G. J.—Simple Method of Making Wire Netting, 217.
Grass and Clover Seed Certification, 533.
Grass, Autumn-sown, Preparation of Seed-beds for, 493.
Grasslands, Establishment and Management of, 45.
Green Peas, 129.
Green Vegetable Bug, 563.

H
Haddon, S. G.—Box for Pullorum Test, 354.
Hancock, J. J.—Identical Twins Needed for Research at Ruakura, 31.
Hand-knitted Summer Woollies for a Child, 299.
Hand Plough Converted to Tractor Lift, 458.
Hay and Silage, 253.
Hems, Measuring and Making, 399.
Herb Garden, 267.
Hill, R. P.—Farming Methods on Danthonia Hills of Hawkes Bay, 551.
Hitchcock, J. H.—Visits by Flock House Trainees, 448.
Hogget Losses, Control of, by Vaccination, 10.
Home Garden Notes, 25, 109, 197, 327, 439, 539.
Honey Dew for Feeding Bees in Canterbury, 351.
Honey-extracting Equipment, Care of, 33.
Honey, Manuka, Extraction and Treatment of, 225.
Hopkins, J. M.—Electric Fence for Feeding off Saved Pastures, 545.
Horticulture Industry, Departmental Service to, 531.
Household Poultry Notes, 37, 153, 281, 393, 435, 577.
Howse, A. C., and Bobby, F. C.—Scheme for Elimination of Pullorum Disease from Poultry Flocks, 353.
Howse, A. C.—Tuberculosis in Poultry, 55.
Hoy, J. M.—Control of Manuka by Blight, 321.

I
Identical Twins for Research at Ruakura, 31.
Inventions, Farming, Patents for, 587.

J
Johnson, Dorothy—
  Christmas Decorations, 513.
  Games for Playing with Babies, 397.
  How Does a Little Child Learn? 79.
  Making Pictures with Paper, 395.
  Paper Games for Children, 283.
  Role of Play in Children's Lives, 603.
  The Development of Speech, 189.
Jowsey, C. G.—Sledge for Collecting Bales behind Pick-up Hay Baler, 333.
June, R. I.—Orchard Shelter, 240.

K
Kennelly, A. G.—
  Green Peas, 129.
  Herb Garden, 267.
  Home Garden Notes, 25, 109.
King, D. L.—Shedder Roller Attachment for Side Rake, 49.
Kitchen, "New Look" in an Old, 295.
Knitted Jumper-cardigan for Young Girl, 81.
Korrick, F. C.—Patents for Farming Inventions, 587.

L
Laing, A. D. M. G.—All-the-year-round Care to Prevent Lambing Troubles, 11.
Lambing Troubles, All-the-year-round Care to Prevent, 11.
Lambs, Losses in, after Wet Weather, 122.
Leitch, C. C.—
  Improving Standard of Canterbury Pastures, 69.
  Seed Production in New Zealand: White Clover, 59.
LeSouef, D. H.—Losses in Lambs after Wet Weather, 122.
Lettuce Culture, 237.
Lime Transport Assistance, 335.
Livestock, Care of, during August, 4; September, 100; October, 196; November, 308; December, 420; January, 532.
Longwill, A—Selection and Management of the Boar, 273.
Lough, R. C.—Disposal of Sewage from Farm Homesteads, 50.
Lucerne, 135.
Lupin Varieties, 561.

M
McCann, P. J.—Feeding and Rearing Dairy Calves, 125.
McDowall, F. H., and McWhirter, G. M.—Alfa Continuous Buttermaking Process, 17.
McIver, W. L.—Household Poultry Notes, 37, 153, 281, 393, 435, 577.
Mackintosh, G. R.—Pre-lambing Shearing of Ewes, 559.
McNab, Edith G.—
  Correct Use of Paint in the Home, 183.
  Left-over Meats, 173.
  Measuring and Making Hems, 399.
  Poultry Cookery, 519.
  Quick Freezing, 413.
  Sewing Fastenings on Garments, 287.
McPherson, G. K.—Establishment and Management of Grasslands, 45.
McWhirter, G. M., and McDowall, F. H.—Alfa Continuous Buttermaking Process, 17.
Manuka Blight Survey, 101.
Manuka, Control of, by Blight, 321.
Market Milk, Testing for Keeping Quality, 241.

Marryatt, E. R.—
  Taranaki Gate Fastener, 560.
  Weatherproof Barns for Baled Hay, 363.
Martin, C. A.—Control of Hogget Losses by Vaccination, 10.
Mastitis, Penicillin for Controlling, 134.
Meats, Left-over, 173.
Merry, D. M. E.—
  Conversion of Hand Plough to Tractor Lift, 458.
  Silage Lifter, 316.
Meteorological Records for May, 36; June, 156; July, 282; August, 384; September, 494; October 602.
Metson, Norma K.—
  Deep-fat Frying, 89.
  Party Savouries, 607.
Meyer Lemon Culture, 245.
Milk and Cream, Care of, 213.
Milk and Cream Grading, Relationship of Farm Dairy Instruction to, 73.
Milking Machines and Dairy Equipment, Cleaning, 487.
Miller, I. S.—History and Evolution of Sheep Breeds: Breeds of Great Britain, 227.
Minister of Agriculture, Statements by, 3, 99, 195, 307, 419, 531.
Montgomery, R. G.—Care of Oddments in the Grower's Woolshed, 355.
Moore, Evelyn E.—
  Cooking with a Pressure Saucepan, 403.
  Nutritive Value of Animal Foods, Fruit, and Vegetables, 185.
  Nutritive Value of Cereals and Dairy Products, 82.
  Nutritive Value of Less-important Foods, 291.
Museums of New Zealand:
  Auckland War Memorial Museum, 615.
  Dominion Museum, 407.
  Otago and Canterbury Museums, 523.

O
Oat Varieties, 35.
Owtram, I. H.—
  Care of Pigs in Summer, 565.
  Pig House Sleeping Floors of Pre-cast Blocks, 481.
  Pig Houses Made from Concrete Blocks, 21.

P
Packing Shed, Layout and Organisation of, 5.
Paint in the Home, Use of, 183.
Palmer-Jones, T.—Diseases of Bees in New Zealand, 483.
Paspalum, 561.
Pastures, Canterbury, 459.
Pasture Seed in Canterbury, Production of, 569.
Pastures, Saved, Electric Fence for Feeding off, 545.
Patents for Farming Inventions, 587.
Paterson, C. R.—
  Care and Management of Honey-extracting Equipment, 33.
  Combating Wasps, 457.
Penicillin for Controlling Mastitis, 134.
Phillips, Enid, B. V.—The Museums of New Zealand:
  Auckland War Memorial Museum, 615.
  Dominion Museum, 407.
  Otago and Canterbury Museums, 523.
Phosphate and Clovers, 271.
Pig Carcasses, Avoiding Losses of, 377.
Pig House Sleeping Floors of Pre-cast Blocks, 481.
Pig Houses Made from Concrete Blocks, 21.
Pig Losses on the Farm, Prevention of, 589.
Pigs, Care of, in Summer, 565.
Potato Bagger, Home-made, 585.
Poultry Breeding, 123, 205, 547.
Poultry Cookery, 519.
Poultry Diseases Caused by Mould and Yeast Infections, 558.
Poultry, Tuberculosis in, 55.
Pre-lambing Shearing of Ewes, 559.
Pressure Saucepan Cooking, 403.
Pullorum Disease, Elimination Scheme for, 353.
Pullorum Test, Box for, 354.

Q
Quick Freezing, 413.
Quince Culture, 65.

R
Rag Rugs, 299, 618.
Rankin, A. R.—Short-rotation Ryegrass in Southland, 279.
Rape, 77.
Renouf, L. R.—Quince Culture, 65.
Richards, J. G.—Dog Chain Fastening, 550.
Ross, W. D.—Unusually-heavy Bullock, 482.
Royal Commission on Sheep Industry, 121.
Ryegrass, Windrowing Attachment for Harvesting, 165.

S
Salisbury, R. M.—Poultry Diseases Caused by Mould and Yeast Infections, 558.
Savouries, 607.
Sears, P. D.—Phosphate and Clovers, 271.
Seasonal Notes by Extension Division, 35, 135, 253, 325, 493, 561.
Seed Production in New Zealand:
  Grass and Clover Seed Certification, 533.
  Subterranean Clover, 157.
  White Clover, 59.
Seeds, Trends in the Production and Export of New Zealand, 99.
Sewage, Farm, Disposal of, 50.
Sewell, T. G.—Manuka Blight Survey, 101.
Shearing of Ewes, Pre-lambing, 559.
Shedder Roller Attachment for Side Rake, 49.
Sheep Breeds of Great Britain, 227.
Sheep Industry, Royal Commission on, 121.
Shepherd, J. R.—Farming in New Zealand: Westland, 255.
Shoes for Children and Adolescents, 181.
Short-rotation Ryegrass in Southland, 279.
Silage and Hay, 253.
Silage Lifter, 316.
Silverware, Cleaning, 511.
Slater, J. G.—Production of Pasture Seed in Canterbury, 569.
Sledge for Collecting Bales behind Pick-up Hay Baler, 333.
Smallfield, P. W.—Farming in New Zealand: Land Improvement, 421.
Smellie, E.—
  Beeswax Salvaged with Hydraulic Press, 163.
  Honey Dew for Feeding Bees in Canterbury, 351.
Smith, E. G.—Canterbury Pastures, 459.
Smocked Frock for Small Girl, 611.
Soil Fertility in Canterbury, Restoring, 459.
Stewart, J. D.—Farming in New Zealand: Malvern County, 337.
Strawberries, Preparing, 619.
Stuart, A.—Farming in New Zealand: Southland, 137.
Subterranean Clover, 157.
Sun Suits, 516.
Survey Marks, Destruction of, 456.
Sutherland, M.—Tree Planting on an East Coast Hill-country Farm, 465.
Swede and Turnip Varieties, 325.

T
Taylor, C. R.—Device for Forming Eyelets on Baling Wire and Straightening Lengths, 433.
Teat for Calves, Artificial, 564.
Thaine, P.—Windrowing Attachment for Harvesting Ryegrass, 165.
Topping, Eva—
  Making Rag Rugs, 618.
  "New Look" in an Old Kitchen, 295.
  Quick-frozen Foods, 86.
  Smocked Frock for Small Girl, 611.
  Strawberries, 619.
  Sun Suits, 516.
Town Milk Grading, 309.
Toys, Felt, 501.
Tree Planting on an East Coast Hill-country Farm, 465.
Tree Surgery, 41.
Tuberculosis in Poultry, 55.
Turnip and Swede Varieties, 325.
Twomey, T. P. J.—Town Milk Grading, 309.

U
Unwin, Eirene, E.—
  Cleaning Silverware, 511.
  Felt Toys, 501.
  Shoes for Children and Adolescents, 181.

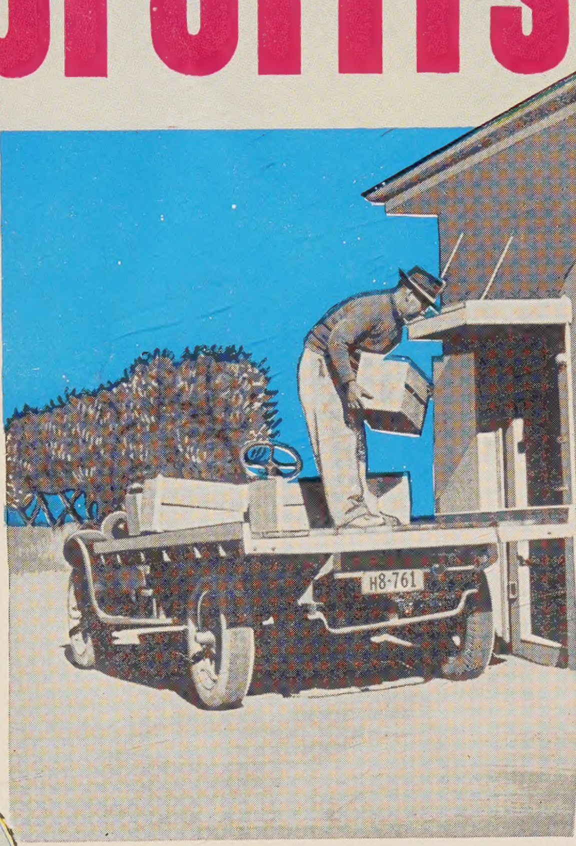
V
Vaccination, Control of Hogget Losses by, 10.
Vegetables, Animal Foods, and Fruit, Nutritive Value of, 185.

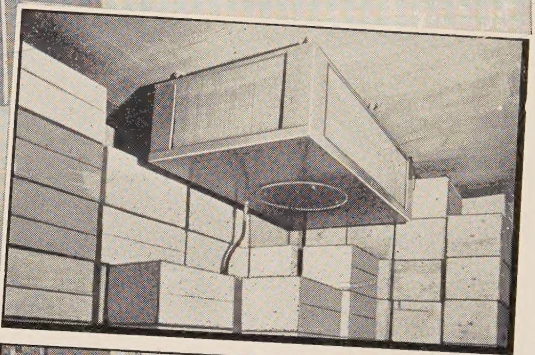
W
Walker, D. E.—North Island Fat-lamb Crosses, 219.
Walsh, R. S.—Extraction and Treatment of Manuka Honey, 225.
Wasps, Combating, 457.
Water Supply Scheme, South Canterbury's Downlands, 206.
Weeds in Growing Crops, Spraying, 35.
Wheat Agreement, International, 419.
White Clover, 59.
Winter, T. S.—Improvement of Bee Stocks in New Zealand, 553.
Wire Netting, Simple Method of Making, 217.
Woods, L. W.—Royal Commission on Sheep Industry, 121.
Wool Oddments, Care of, 355.

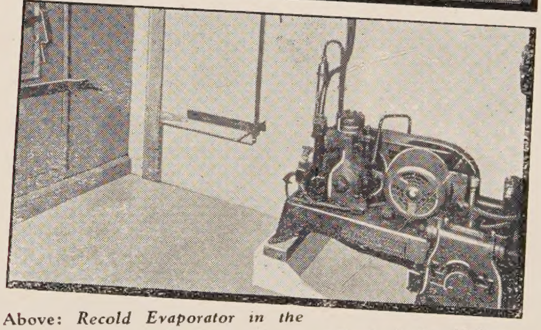
SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING
THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMI
DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION
SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 18
1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVI
SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING
THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMI
DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION
SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 18
1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVI
SERVING THE DOMINION DOMINION SINCE 1861 SERVING
THE DOMINION 1861 SERVING THE DOMI
DOMINION THE DOMINION
SINCE 1861 ION SINCE 18
1861 1861 SERVI
SERVING
THE DOMI
NION
18
1861 BANK OF NEW ZEALAND RVI
NG
THE DOMI
NION
SINCE NCE 18
1861 SERVING 861 SERVI
SERVING THE 861 SERVING
THE DOMINION VING THE DOMI
DOMINION SINCE 1861 SERVING THE DOMINION
SINCE 1861 SERVING THE DOMINION SINCE SERVING THE DOMINION SINCE 18
1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVI
SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING
THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMI
DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION
SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 18
1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVI
SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING
THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMI
DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION
SINCE 1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 18
1861 SERVING THE DOMINION SINCE 1861 SERVING THE DOMINION SINCE 1861

Printed by Blundell Bros. Ltd. (The Evening Post), Wellington—28368

Make profits out of COOL STORAGE







HOW TO FORGET ABOUT

- GLUTTED MARKETS
- BAD WEATHER
- TRANSPORT TROUBLES
- LABOUR TROUBLES, HOLIDAY DELAYS

Men who have installed WESTINGHOUSE REFRIGERATION units in their orchards have no worries about fruit rotting before it is sold or being released in over-stocked markets. By using cool storage the fruit is kept in controlled and perfect condition until prices are more favourable . . . until the seasonal transport and labour rush is over. Many WESTINGHOUSE REFRIGERATION units now being used by well informed and practical New Zealand orchardists, have been operating without fail over long periods. As orchards vary in size, class of fruit, location, etc., Westinghouse trained engineers investigate each orchard carefully before recommendations for type of unit are made. After installation, a thorough Westinghouse servicing plan is put into operation—no matter what the district. You are invited to write to the address given below for full particulars of units available.

Above: *Recold Evaporator in the cool store at Mr. H. E. Stephens' orchard, Stoke, Nelson.*

Below: *Part of the Westinghouse Recold Equipment installed for Mr. E. J. Freeman, Styx, Christchurch.*

WESTINGHOUSE ORCHARD REFRIGERATION

Quotations given FREE to all orchardists interested in saving waste the WESTINGHOUSE way.

H. W. CLARKE & CO. LTD., 42-46 Cable Street, Wellington; 209 Cashel Street, Christchurch; 105 Anzac Avenue, Auckland; 28A Bridge Street, Nelson.
H. E. THOMAS LTD., Moray Place, Dunedin.

Where does

EUROPA

Petrol come from ?

From the

BRITISH

Protectorate of Bahrein
in the Persian Gulf . .

E.G.8